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INCENTIVES TO STUDY

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Incentives to Study

A SURVEY OF STUDENT OPINION

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TO
L. B.
IN GRATEFUL REMEMBRANCE

PREFACE

THE Student Survey described in this volume sprang from a very real interest manifested by certain leading undergraduates at Yale University in student personnel problems. These men were discussing such questions as: What, after all, is the real purpose of a college education? What processes might improve students' adjustment both to the college situation and, later, to the world of affairs? What factors chiefly motivate students academically and, if real apathy exists among a large body of undergraduates in this respect, to what is it attributable? How may the methods of selection of students for admission be improved? And above all how can genuine intellectual stimulus, such as students manifest in so many other ways, be reawakened in connection with the undergraduate's essential job of study?

Spontaneous interest in these matters found expression in a Survey conducted in April, 1926, largely along the lines which students themselves suggested. The purposes of the Survey were formally stated at that time as follows:

This survey has been formulated by students and endorsed by the Undergraduate Student Councils. It aims (1) to collect data of importance to future educational and administrative policies of the University; (2) to secure reliable information about the undergraduate body which should prove of interest and value to a large majority of present and future students; (3) to give undergraduates an opportunity, long sought, of expressing themselves on various questions of everyday concern to them; (4) to determine whether student opinion on such questions can, as a practical matter, be thus analyzed and utilized advantageously; (5) to ascertain whether a need for further investigations of an analogous nature and perhaps for a permanent University Personnel Bureau exists; and (6) if so, toward what specific problems, if any (e.g., selection, orientation, vocational guidance, etc.), such future studies might profitably be directed.

The growth of student interest in such topics, and the increasing attention paid to them by leaders of campus opinion recently, have been interesting to follow. At no time during approximately twenty years of my personal contact with Yale, first as a student and later as an officer, has the student body seemed to me as vitally concerned in questions related to the curriculum, as at present. At the same time, and as a perhaps not unnatural result of this concern, students are also more acutely critical now than heretofore. A Committee of the Student Council of Yale College, entirely on its own initiative, has recently spent months in discussing the course of study with student and faculty leaders and in the *Yale Daily News* of June 6, 1928, there appeared the admirable report made to the Yale Corporation by this voluntary Committee.

This Student Council report which is reproduced in the Appendix (Section "E") has no direct relation to the Student Survey of 1926 upon which this volume is based. In a certain sense, however, it represents crystallization of that same interest and criticism just mentioned, whose initial concrete manifestation was through the earlier Survey. Inclusion

of the Council report as an Appendix to this volume therefore seems appropriate. The very fact that student leaders in the midst of all their Senior year responsibilities and activities have taken the interest and time to prepare such an analysis of the curriculum, entirely of their own volition, is itself significant. Anyone reading the report, moreover, whether or not he agree with the specific recommendations embodied therein, cannot but be impressed with the thorough and wholly intelligent manner in which the problems it raises are discussed. That Yale today is graduating men with a breadth of culture and intellectual force, capable of producing such a report, gives evidence that her educational powers are still operative. When these very students so keenly criticize the college curriculum however, it is equally clear that the latter, at least to some extent, fails to meet the modern situation and the present demands of our student body.

So much material was obtained from the 1926 Survey that its analysis has continued for over two years. Preliminary reports thereof were first made through the columns of the *Yale Daily News* to the students directly, in acknowledgment of their splendid coöperation and interest in the Survey. Subsequently the author utilized a large amount of this material in preparation of a dissertation for the degree of Doctor of Philosophy at Yale University. Inquiries received meanwhile concerning the investigation have made it seem advisable now to publish the findings in book form. Although this presentation has been simplified as much as possible, such statistical basis as seems necessary to support the argument presented has been retained in the published text.

The possible establishment of a Personnel Department at Yale was one of the topics under discussion at the time of the Student Survey. Through the generosity of the late Mr. Charles H. Ludington, of the Class of 1889, this possibility was realized in 1927. Data obtained from the Survey have proved to be of very real value in development of the policies of this new Department. We believe, however, that certain of the material is applicable to a wider field as well. Despite the local nature of the investigation itself, the conclusions reached may reasonably be supposed to contain implications for educational procedure in general. Particularly we hope that this work may in some degree encourage more recognition of the importance of student opinion and the value to educational institutions of giving present-day undergraduates the hearing which their ability and interest warrant.

The undergraduate has of late years grown up intellectually and colleges will miss a great opportunity if they fail to realize how much more responsibility students will take, and what valuable criticism can be obtained from them, if only this assumption of their mental maturity be granted. The growing interest of students in their own educational business (as exemplified by their coöperation in this Student Survey and by such other indications as the Student Council report referred to above and similar student investigations of the Course of Study at other institutions) should further recognition of the fact that, if we are to graduate them as men and women, we must begin earlier to treat them as such. Only then can we expect them to accept all the responsibility of which they are potentially capable.

Although the methods herein developed are relatively inexact as compared with the

precise procedures of the psychological or statistical laboratory, it is hoped that they may contain some suggestions of value to other workers in this field. Many dilemmas which had not been anticipated arose during the course of this investigation, and I have no doubt that still others may inadvertently have escaped attention. I can only hope that any such oversights will be pointed out in order that they may be guarded against in the future. If the type of investigation and methods which we have had the temerity to attempt prove sufficiently sound fundamentally, it should be possible, through such criticism, eventually to improve their technique so that more exact study along the lines herein suggested may follow.

In the interests of clarity it has seemed advisable, throughout the text, to capitalize the titles of certain student classifications when these are used in a special sense. Thus when discussing groups specifically differentiated in respect to some factor (*e.g.*, Economic Status) such a term is capitalized; this is not done, however, with even the same terms when the latter are employed in a more general manner. When citing previous evidence it has seemed preferable, instead of encumbering the pages with footnotes, to employ the method of reference by number to items listed in the Bibliography. The latter makes no pretension to completeness and is in fact limited to such work as seems to bear rather specifically upon some phase of the present study.

Practical exigencies of setting the tables and of pagination have introduced certain superficial variations in form or typographical style. It is hoped that the reader will not be unduly inconvenienced by minor irregularities in this respect or by the occasional apparent inconsistencies which the specialized use of capitals, referred to above, have necessitated.

In conclusion, I wish to express my very real gratitude to the many individuals who have been of invaluable assistance in the analysis and preparation of this material. Space will not permit specific acknowledgment here of all those to whom I feel genuinely indebted. Mention must, however, particularly be made of the members of the original Student Survey group, headed by Mr. Russell Lee Post, Chairman of the 1927 *News* Board, and including F. A. Potts, '26, Edward Ingalls, Jr., '26 S., C. D. McCoy, '26 S., R. C. Lanphier, Jr., '27 S., and D. T. Bartholomew, Chairman of the 1928 *Yale News* Board. These men were primarily responsible for initiating and carrying on the Survey and in this work they received valuable assistance from the other members of the Student Committee, whose names are given in the Questionnaire reproduced in the Appendix.

Messrs. E. R. Hilgard and C. Li of the Graduate School, and Mr. P. S. Burnham, '28, carefully carried out a great part of the statistical calculations and made many helpful suggestions regarding analysis of this material. Mr. George Shepherd, '28, voluntarily undertook the extremely laborious task of tabulating replies to the battery of questions regarding required vs. elective courses (Chapter X) and computing the "correspondence ratios" relative thereto. My obligation to all of these student collaborators is very real.

Assistance and encouragement in the Student Survey project were also offered by many members of the Yale faculty and administrative officers. Helpful advice as to analysis of the data was received from Professors Roswell P. Angier and E. S. Robinson of the Depart-

ment of Psychology and Mark A. May of the Department of Education. To Professor Llewellyn T. Spencer of the Department of Psychology, I am immeasurably indebted for many suggestions as to organization and revision of the material and for his further aid in reading the manuscript and proof. The advice and support of President James Rowland Angell and the grant he obtained from the University for the Student Survey—without which aid it could not have been undertaken—are also deeply appreciated.

Finally, the writer wishes to acknowledge his gratitude to the members of his office force in the Bureau of Appointments and the Department of Personnel Study, who have not only freely given of their own time to this investigation but have also patiently accepted the many other impositions which its preparation has inflicted upon them during the past two years.

A. B. C.

New Haven, Connecticut,

October 31, 1928.

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INCENTIVES TO STUDY

I.

INTRODUCTION

HIGHER education today is still—as for many years past—in a state of flux. Initially patterned after the English tradition to train students for service in the learned professions it has since developed and cultivated a belief in the abiding value of “cultural” study *per se*. Historically our collegiate curricula were vocational, and for a century and a half—no longer—remained so. Then came a gradual change, at first not so much in the training, as in the careers chosen by college students. The proportion of graduates entering the traditional professions has steadily declined since the reconstruction period following the Civil War. New professions, such as engineering, have been recognized and many forms of industrial, financial, and commercial enterprise have developed professional points of view and responsibilities.

Today the great majority of our college men and women are entering one or another branch of the great profession known as business, and new educational aims have inevitably followed this change in the social purpose of our college population. The teacher, the doctor, the lawyer, and the minister not only are expected first to obtain an undergraduate degree, preparatory to study of the vastly increased subject matter in their general fields, but thereafter frequently to specialize in some particular phase of their chosen work. Thus professional curricula have been extended in both directions and today even the minority expecting to enter these professions tend naturally to elect pre-professional courses in college. The influence of the business group may be readily seen in the number of frankly vocational courses offered today by even the most conservatively “cultural” institutions. Pure education, in the sense of liberal studies free from any utilitarian implications, maintains itself with increasing difficulty against the demands of a practical and materialistic age.

That such cultural studies do have real value and are in fact the essence of education in its largest and truest sense, the present writer firmly believes. But it would seem time for the special advocates of these studies to interpret clearly to students such values in terms of their future usefulness. Pride in their non-utilitarian quality alone will no longer suffice as an answer to the critics. If such values exist, surely they may be defined, and liberal curricula be better related to life purposes, so that students may once more be quickened thereby to genuine intellectual curiosity. The original stimuli no longer serve—or are inhibited by others. New presentations are necessary if cultural desiderata are to be realized.

The writer has no fond and complacent hope of coping successfully with this problem which has troubled the best minds in education for many years and which, though acutely analyzed by many critics, remains a riddle still. In fact, the present study makes no pretense even of attacking a question of such scope and importance. It does attempt, however, to investigate certain factors seemingly related to students' incentive and motivation toward

academic work, in the hope of arriving at conclusions bearing on this larger problem of the effectiveness of higher education. Our general topic, then, deals with the analysis of these factors and particularly with the educational value of *purposive motivation* and the need for greater emphasis thereon in our educational procedure. This we shall attempt through consideration of such more specific questions as the following:

1. What measurable factors significantly affect the quality of students' classroom work?
2. To what extent is the influence of such factors dependent upon variations in students' *motivation*?
3. Are there demonstrable differences among students, in both capacity and effort, and if so what is their relative significance?
4. Do differences in students' effort and motivation tend to be generally associated with certain other recognizable factors—such as family influences, financial handicaps or advantages, students' aims in coming to college, their intended occupation, or degree of orientation toward life purpose?
5. Can any such objective factors as those just named be utilized as possible indicators of relatively high degrees of incentive and motivation?
6. How may colleges practically consider such factors as an aid in selection of students for admission?
7. What is the relation of purposive academic motivation to the value derived by students from their education?
8. May students perhaps be motivated in some degree indirectly toward their academic work?
9. How do extra-curriculum activities affect student motivation and their academic records?
10. How do students' own estimates as to the value of elective vs. required courses of study compare, and do these opinions suggest any further means of increasing academic motivation?

We can hardly expect through this investigation to find answers to all of these questions, or, indeed, to reach final and complete conclusions regarding even the simplest of them. Still less do we hope to solve any of the more fundamental problems first mentioned, of which these specific and more restricted questions are only minor parts. We hope, however, that reliable results may be obtained regarding some of these topics, at least. Certainly the importance of the general problems is recognized, though there has been little quantitative study of them even on the limited basis here undertaken. Our attempt, however inadequate, to replace speculation by objective analysis, may at least suggest ways and means for broader and more fruitful subsequent study in this field.

To attack such questions involves first, some discussion of the criteria of success in college or measures of accomplishment; and next, of differences between students in such respects as initial ability, external handicaps or advantages, and motivation. Complexity of the problem necessitates so methodical an approach that considerations of broad applicability must, for the most part, be initially deferred.

CRITERIA OF ACADEMIC SUCCESS

MANY students and not a few teachers frankly feel that grades in study alone are not by any means a satisfactory criterion of the degree to which any individual realizes and profits by the opportunities of a college course. Certainly it must be recognized that many other phases of American college life enter too largely into students' development for their value

and influence not to be given serious thought in this connection. All too frequently the extent to which students measure up to their apparent possibilities is judged by their classroom records chiefly or even wholly. To neglect the importance and influence of extra-curriculum activities, however we may feel about them, is to run the risk of vitiating our findings. To allow such factors to become the chief measures of academic achievement, however, is to admit that our colleges are no longer *educational* institutions—an admission which the present writer at least is unwilling to make. Therefore while we shall consider extra-curriculum factors and utilize what data of value we can obtain from this source, we shall retain the academic record as the ultimate measure of the individual's success at his job of being a student.

What then may be considered the major factors determining a student's grades? Are these constants or variables and, if the latter, how can they be sufficiently controlled to permit us to evaluate their relative importance? Let us assume, as a starting point, the existence of four such variable factors—ability, external circumstances, incentive, and experience. No doubt the existence and influence of each of these might be taken for granted as obvious. Yet if we are to consider them and attempt in any way to evaluate their relative importance, quantitative analyses are essential. Before presenting any objective evidence as to the extent of student differences in any of these respects, however, it may be advisable to enlarge somewhat upon the influences to be so analyzed, and upon the degree of interaction which we may expect to find between them.

INDIVIDUAL DIFFERENCES IN STUDENTS

THAT students differ in academic ability or aptitude any teacher knows full well. Certainly the teaching of many students, varying in their purposes, attitudes, and perceptual readiness, is a complicated matter. If the most is to be obtained for and from those of superior ability, many others will fail utterly to profit by a course; while if the presentation is simplified so that all can grasp it, the superior few will doze in ennui. Our educational system, for years adjusted to the average apparently on the theory of "the greatest good to the greatest number," is now being assailed as leveled at mediocrity, and as insufficiently cognizant of these very individual differences. Among the most outspoken critics, moreover, are to be counted many accredited representatives of our traditionally conservative eastern colleges. One cannot lightly ignore the suggestions of reform advocated by such educational authorities as those who have recently evidenced their dissatisfaction with present curriculum methods. Specific mention can here be made of a few of these only. (The numbers in parentheses refer to the citations listed, together with other references bearing upon our general topic, in Appendix "A," the Bibliography.)

Thus President Aydelotte (1) has stated: "The instruction of the average American student has been standardized beyond the point where uniformity has value . . . The system assumes that all college students are exactly alike, that all subjects are equal in educational value, that all instruction in institutions of a certain grade is approximately equal in effectiveness, and that when you have accumulated a certain quantity of credit you are entitled

to a Bachelor's Degree. These assumptions are of course all of them false . . . Our ordinary academic system is planned to meet the needs of that hypothetical individual—the average student. It does not pay him the compliment of assuming that his ability is very great or that he has any consuming interest in his studies. Its purpose is to make sure that he does a certain amount of carefully specified routine work.”

Mr. Abraham Flexner goes so far as to say that “In America there is no necessary presumption that a man who has had a college education is educated at all” (2, p. 731). Again, Dean Holmes of Harvard writes (3, p. 494): “So far as we aim at thoroughness at all, it is the superficial thoroughness of circumnavigation. Even our college graduates too often secure only a series of passing views of the islands of knowledge, including a view from the air . . . Our colleges, and indeed our graduate schools, suffer from the disease that keeps our secondary schools permanently enfeebled—‘credititis’—the itch for credits, points, units, and semester hours . . . Educationally we are a nation of credit hunters and degree worshipers. Even our graduate students, preparing to teach, talk of how many semester hours they have ‘taken’ with Dr. X or Dr. Y. To have ‘had work’ with Dr. So-and-So, to say ‘I had his work last semester,’ is offered as a substitute for knowledge of the subject and independent views as to its issues. Everywhere the emphasis is on machinery and bookkeeping. Standardization has laid a deadening hand upon us. There is much attention to processes and little assessment of results.”

President Farrand of Cornell states (4), “One of the most frequent indictments of our present system is that the student of exceptional ability is necessarily penalized in his progress in the interests of the average student of less ability.”

President Angell has referred to the “lock-step system” of education and has written (5, p. 10) that “Meanwhile we have not as yet begun to sound the possibilities of stirring our young men to more active and continuous use of their minds.”

Mr. Robert Lincoln Kelly, Permanent Secretary of the Association of American Colleges, has compressed current criticisms into sufficiently small compass to enable his summary thereof to be here presented as follows (96, p. 223): “Some of the charges against the present régime are: College courses are organized on the lines of secondary schools. Short clear-cut daily assignments are made. There are frequent tests and examinations. There are sharp rules dealing with cuts and absences. There is the absence, in the liberal colleges, of definitely formulated aim. The appeal is chiefly to the memory. The method of procedure is analytic and not synthetic. The educational machinery and the method of teaching are set up for mass production. Students are encouraged to group rather than individual effort. Scientific, literary, and historical technique crush out the weightier matter of human living. The curriculum is made up of unrelated ‘courses,’ of unorganized details. The measures of achievement are quantitative. Few graduates are leaders in matters of public policy. Graduates do not grasp problems as a whole. Faculty members lack knowledge or ability to correlate their particular subjects with collateral or allied subjects. Superficiality all along the line.”

Such opinions as the foregoing can hardly be discredited as the attacks of mere radical and destructive pedagogues. Were it necessary, much other evidence could be marshaled in their support (7 to 12, inclusive; 30).

Further emphasis on individual differences in intellectual ability would be but a recital of platitudes in elaboration of the obvious. Yet the *extent* to which such differences exist is perhaps not fully appreciated by the majority of teachers. Still less are the influences of certain fortuitous handicaps and advantages—the factor of external conditions—realized. Of two students equally backward in their classroom work, one may be potentially superior to a marked degree, but handicapped through family environment, inferior preparation, the necessity of earning his own expenses, or a combination of such difficulties; while the other may simply be intellectually unable to cope with college work, despite all the external advantages at his disposal. It would be sufficiently difficult to determine reliably the relative ability and degree of external handicap or advantage for every student, were those the only factors to consider. But when the third influence of incentive, itself fluctuating in degree, enters in, the result is further complicated and the confusion greatly increased (18, 20, 38, 139, 140, 143). Every teacher will no doubt again agree that incentives differ not only among different students but even for the same student at different times and with respect to different courses. We have some means, however imperfect, for estimating objectively the differences in ability and in external conditions; we have few if any for gauging incentive and motivation. Subjective judgment or inference from results, both uncertain at best, are our chief measures of this elusive and changeable quality.

INTERACTION OF DIFFERENT FACTORS

THE difficulty of analyzing merely the variability of each of such factors as ability, external conditions, and incentives is apparent, for all three interlace to such an extent that the apparent influence of each may be at variance with its true significance. In other words, even our apparently objective measure of variability of any one of these factors is probably affected in part by the influence of each of the others. The same external handicaps which may operate against a student's classroom record may also pull down his score on any scholastic aptitude or intelligence test, designed under ideal conditions to measure reliably his real capacity. Again, students may vary in their attitude toward such tests and in the resulting effort expended upon them (23, 24, 142, 143). The assumption that every student does as well as he can on such a test, while necessary to its practical administration, is nevertheless open to question. Thus the interaction of these various factors complicates every phase of the problem and it is unlikely that any measure of one such influence may ever be freed entirely from influence of the others. If this is true of each separate set of differences, how much more true is it of the resultant of all three variables! Academic and total achievement are the sum of this trio of influences and to segregate and evaluate separately the precise relative effect of each, indeed seems beyond the scope of present and perhaps future methods and technique.

EXPERIENCE AND STUDY HABITS

As yet, beyond mentioning it, we have not discussed an important further variable—experience—emphasized by Pyle (13). Unfortunately we have no means, other than by inference from admission criteria, of even estimating differences in this respect. The College Board Entrance Examinations, however, at least insure more uniformity in the pre-college academic training of students at Yale University, where this study was made, than could be assumed were admission to Yale (except for relatively few “transfers”) not solely by examination. To be sure, Yale students come from many different kinds and sizes of schools and from all parts of the country but, in so far as they have all had to satisfy uniform standards of admission, these original variations in their scholastic experience have been compensated for, at least to a considerable degree (44).

That differences nevertheless exist among our students, in respect to experience and study-habits, there is little doubt. As these cannot be analyzed out or controlled, we shall have to ignore them and assume that, for any substantial number of cases, the effect of such variations upon group averages will naturally cancel out. This is a logical assumption with respect to classroom grades, since these are measures of *achievement* rather than of *procedure* (43). No such assumption necessarily holds, however, with respect to time spent in study. We may, therefore, suppose average grades to be much less affected by this uncontrolled source of error—variations in experience and study-habits—than time in study, an index of procedure, might be. This is one reason why we shall use grades, rather than time, as our chief criterion of academic effort.

SIGNIFICANCE OF CONSISTENT DIFFERENCES

THESE comments as to the difficulties of reaching reliable conclusions, with the factors of influence so interwoven, are here mentioned merely to explain why no large observable differences may be expected under existing conditions. With one factor pulling one way and one another, whenever the records of a considerable number of students are compared, it is evident that the full effect of any one alone cannot freely manifest itself. Hence, in such a study, we claim that *small but consistent differences properly merit recognition* and, when allowance is made for the conflicting interplay of various factors, that any such consistent differences as are demonstrable at all have a greater significance than mere relative magnitude alone might indicate. Furthermore, even academic grades themselves, our criteria of success, have relatively low individual reliability (27, 28, 29, 45, 57). Given, then, such a complex situation with different factors operating, it is evident that no large differences in academic achievement of the groups compared may be expected and that *any* differentiation may be considered as significant if it appears consistently. If no one of these factors can ever operate quite independently of the influence of others, then the most we can expect, as indicative of its effect upon a given group, is that *some* difference not attributable to the others appears related to the particular factor in question, and varies with it to *some* appreciable degree.

Our first aim will then be, by comparing groups of students different in certain respects

and as like as possible in others, to investigate the relative differences between such groups, in academic or total achievement. It will be necessary to discuss the demonstrable range of difference in ability and external conditions and then to investigate the other variations (as for instance in motivation) among students relatively *undifferentiated* in respect to these two preceding factors. If we can thus show that discernible differences in respect to motivation certainly do exist and are reflected in academic records and related thereto, we may then proceed to investigate such differences further, attempt to evaluate them and to ascertain whether the degree of purpose and motivation is significantly related to the quality of academic work.

II.

THE YALE STUDENT SURVEY OF 1926

IN order to investigate objectively the influence of these various factors and to study comprehensively the various elements involved in the motivation of college students, a Personnel Survey was made at Yale University in the spring of 1926. The method used was that of a questionnaire sent to each undergraduate to be filled out at his convenience and returned within a week's time. Accompanying the questionnaire was a time chart upon which each student was asked to record the distribution of his time in study, extra-curriculum activities, leisure, sleep, etc., over a period of one week beginning Monday morning, April 12. No compulsion was placed upon students in connection with this Survey, their coöperation being entirely voluntary. The Survey was, therefore, in itself an experiment in motivation. As can readily be seen, the questionnaire (reproduced in the Appendix) is complicated and rather difficult to fill out. The natural reaction of a group of students to such a Survey, particularly one involving the expenditure of a considerable amount of time in completion of the blanks, would obviously be a negative one. When the plan was first under consideration, an outline thereof, with typical questions, was shown to about fifty students and an equal number of members of the Yale faculty. The students as a whole evinced a reasonable amount of interest in the project but were skeptical as to the degree of response which might be expected. The members of the faculty were as a group distinctly more pessimistic in this respect than were the students. Whether personally favoring the plan or not, the almost unanimous prediction of the faculty members consulted was that the student response would be too small to prove of any practical value. Estimates of students as to the proportion of replies which might be anticipated ran from around 25 per cent to 75 per cent. Some faculty members averred that not over one hundred students could be induced to fill out such a questionnaire of their own free will. The majority stated that not over 10 per cent to 20 per cent of returns might be received, while none thought it reasonable to expect that more than one-third of the questionnaires would be answered and returned. As the actual return was more than 50 per cent, the experiment may be considered to have been successful and the data obtained thereby to have reasonable reliability.

STUDENT COÖPERATION

THE initial reaction of students to the plan when it was announced varied in different cases from extreme enthusiasm to violent opposition. As the success of the experiment as a whole and the reliability of the data were both dependent on the development of a favorable student attitude toward the project it may be of value and interest here to describe in detail the method used in appealing to the student body and winning the coöperation of a majority of undergraduates. It is the opinion of the writer that at such an institution as Yale, whose student body is relatively sophisticated, independent, and intellectually mature, a project of

this type can be successfully initiated only through the stimulation of genuine student interest therein. This means that the coöperation of leaders in the undergraduate community must not only be secured but that such men must have a genuine part in the development of the project itself; so that the latter comes from the student body through its own volition, rather than is imposed upon it as an arbitrary institutional demand or even an administrative request. It was felt advisable from the first to use no official compulsion with respect to the Survey since that would *ipso facto* antagonize the student body and probably vitiate the data in the majority of cases. It was also felt that even a smaller proportion of replies given by men really interested in the topics in question would furnish information of greater total value and of far more significance and frankness, than would a much larger superficial return made under the compulsion of institutional authority but, by that very token, of questionable validity.

Analyses of answers to the various questions asked students all indicate that such information as was obtained probably reflected, as well as might be expected, a serious intention to be accurate. Some of the questions yielded objective data and others, subjective opinions. The latter, however frankly they may have been given, are of course open to the criticism that such opinion may be erroneous and that the individual himself may have slight comprehension of the true factors influencing the decision so that his answer, while subjectively truthful, may nevertheless be objectively inaccurate. Certain of the subjective questions were themselves put into the blanks partly for the purpose of stimulating the students in the undertaking as a whole. The answers of students to such questions, while interesting, may not be regarded as necessarily significant. Yet in offering an opportunity for the expression of undergraduate opinion on topics of genuine interest to students and concerning which they would not ordinarily be consulted, the inclusion of such questions should have a beneficial effect by increasing interest in the investigation as a whole and making replies as accurate and frank as possible.

Furthermore, a number of topics not related to the problem of student incentives or motivation were included in the Survey because of genuine desire to secure information or opinion from students concerning questions of educational or administrative importance to the University. Inspection of the Questionnaire itself will best illustrate the different types of questions asked. It is not necessary to specify here in further detail the exact purpose for which each question was included. A number of the questions moreover, as previously explained, are not of particular significance to the present study. Together with more detailed description of the Student Survey procedure, analysis of replies to certain of these questions is, however, given in the Appendix (Section C) as a matter of record, illustration of method, and further evidence in behalf of our data. A composite picture of headings to articles about the Survey published in the *Yale Daily News* is here reproduced, as a concrete illustration of the wide interest and coöperation accorded it by undergraduates.



COÖPERATION OF LEADING STUDENTS

IN general the leaders of student organizations evidenced greater interest in the Survey than did those who were not thus engaged in student affairs. Of students not engaged in extra-curriculum activities, less than one-third replied, while *more than two-thirds of those active in undergraduate affairs coöperated* in the undertaking. It would, therefore, appear that the data may properly be considered to have a significance greater than that measured simply by the total proportion of replies to the total questionnaires sent out. This very fact, of course, also suggests that a certain amount of sampling error has thereby been introduced. This question is discussed in the following chapter and evidence introduced there and elsewhere (*cf.* Table IV) to show that students coöperating in the Survey do not sufficiently differ scholastically from the entire student body to invalidate our subsequent analyses.

Three conclusions may be permitted in this connection.

1. That the more active and busy students are the ones who, when properly approached, can be most readily interested in such an undertaking.
2. That however effectively a general publicity campaign may be organized in the support of such an undertaking, personal interest and active support of representative students are the most important factors in securing a favorable response.
3. That granted such a presentation as will win the support of student leaders, a surprisingly gratifying response and data of great value and relatively high reliability may be expected from University undergraduates.

The experience and opinions of Dean Wilkins (32) of Chicago and Professor Richardson (7) of Dartmouth support these comments.

III.

OBJECTIVE EVIDENCE AS TO AUTHENTICITY OF THE DATA

CAREFUL study of individual replies to the student Questionnaire indicated the wisdom of the "Voluntary coöperation" method. Due to the complex nature of the blank, perfunctory compliance with the request for coöperation was reflected in only a few instances. In most cases the student either became sufficiently interested in the Survey to coöperate whole-heartedly and expend real time and effort on his answers to the questions, or else, if not won over to genuine interest in it, he was so discouraged by the apparent difficulty of compliance that he made no return at all. As was to be expected, a number of students who were willing to answer the Questionnaire either did not return time charts or had not kept the latter accurately enough for them to be statistically usable. The time distribution data obtained are therefore based on only 1,306 cases, 46 per cent of the undergraduate body; while the total number of returns, 1,510, represented 54 per cent of the blanks sent out. The smallest number of replies received to any particular question was with respect to "family income" and "own expenses," since some students were unwilling to answer these questions because of their personal nature. Therefore, the "family income" data obtained are based on only 1,265 cases and information about annual expenses on only 1,298. Even these figures, however, represent a 45 per cent return while over 50 per cent of replies were received in answer to most of the queries. The following table shows the number of blanks returned from each class. The first group in each of the three upper classes refers to members of Yale College; the next to those of the Sheffield Scientific School. Freshmen (1929) had not as yet made their choice of an upper school when these figures were tabulated.

TABLE I
Number and Percentage of Questionnaires Returned

<i>Class Group</i>	<i>Sent Out</i>	<i>Returned</i>	<i>Percentage of Return</i>
1926 Seniors	401	206	51
1926 S. Seniors	213	94	44
Total Seniors	614	300	49
1927 Juniors	510	251	49
1927 S. Juniors	221	104	47
Total Juniors	731	355	49
1928 Sophomores	453	341	75
1928 S. Sophomores	215	130	60
Total Sophomores	668	471	70
1929 Freshmen	798	384	48
<i>Grand Total</i>	2,811	1,510	54

The number of forms sent out is less by about two hundred than the total number of undergraduates enrolled according to the University catalog, at the opening of the academic year 1925-1926. As the Survey was made in the last quarter of the academic year the actual number of undergraduates then still in residence at the University had, however, been reduced to less than 2,850. Illness, absence, or mistakes in delivery account for the remaining small discrepancy between the 2,811 given above as sent out, and the actual net total of students in residence at the time of the Survey.

An objective estimate of the probable authenticity of the data obtained may be derived from inspection of distribution tables as to time spent in filling out the questionnaire and time chart, reports of personal expenses, family income, time spent in study, etc. The following table gives the time reported for answering the Questionnaire.

TABLE II
Reported Time Spent in Completing Questionnaire

<i>Time Reported Spent in Completing Questionnaire</i>	<i>1929 Freshmen</i>	<i>College '26-'27-'28</i>	<i>S.S.S. '26-'27-'28</i>	<i>All Classes</i>
½ hour	34	58	17	109
1 hour	162	242	103	507
1½ hours	91	195	82	368
2 hours	45	144	62	251
2½ hours	11	25	13	49
3 hours	8	23	10	41
Over 3 hours	4	15	4	23

This indicates from internal evidence that the greater majority of the students returning Questionnaires spent no small amount of time thereon. The times given in the above table were specifically for completion of the Questionnaire alone, not including additional time spent in the majority of cases in keeping the time chart record as well. The distribution, although somewhat skewed, is sufficiently regular to suggest again that our data are trustworthy.

TIME REPORTED SPENT IN STUDY

FIGURES from the time chart as to time spent in study are of particular interest and value in connection with grades. The following chart illustrates the distribution of reported study times for the week April 12 to 19. This was the first week after the close of the Easter vacation, previous to which the mid-term examination had been held. This was chosen because, so far as study is concerned, it appeared to be as nearly typical of the college year as any one week could be.

TABLE III

Reported Time in Study for Week of April 12

*Number of Hours Reported as Spent per Week
in Preparation of Class Assignments (Exclusive
of Actual Class or Laboratory Periods)*

Number of Cases

36	50
34	35
32	43
30	37
28	63
26	78
24	102
22	111
20	145
18	136
16	116
14	116
12	102
10	68
8	50
6	30
4	14
2	8
0	2
<hr/>	
20.56 Mean	1,306 Total
7.74 Standard Deviation	

With the exception of a small hump at one extreme, the time distribution is distinctly regular. The hump no doubt evidences a true condition, reflecting the cases of students who, for one reason or another, really are strongly motivated toward study. Inspection of the academic records of the individual cases making up this irregular upper extremity of the frequency table indicates that, so far as they are concerned, the reported times are probably accurate. As to the accuracy of the data for the whole number of students reporting, we can but rely on such internal evidence as is furnished by the regularity of this distribution and upon certain other data to follow.

CORRESPONDENCE WITH OTHER INVESTIGATIONS

THE reported study times accord in general with corresponding data from such previous investigations as afford a basis of comparison with our figures. Hutchinson and Connard (33) found that Vassar College students spend on the average about twenty-three hours per week in study (exclusive of classroom periods). This somewhat exceeds, as might be expected, the corresponding weekly mean of our table above. As at Yale, so at Vassar, Seniors report the least time devoted to study, and Freshmen the most. In this same article mention is made of analogous investigations (31) (apparently unpublished) at Mount Holyoke and Bryn Mawr, which indicate that the Vassar figures are typical for women students,

at least in the eastern colleges. The mean study period of students at the State University of Iowa, though reported by King (34) on a daily basis, also agrees roughly, if averaged for a week, with our figures. Dean Wilkins' (32) Committee Report at Chicago indicates that the median time spent on courses (inclusive of classes) is between thirty-five and forty hours per week, which is roughly comparable to between twenty and twenty-five hours in study-preparation. The total curriculum average at Yale (p. 20) is 37.2 hours, which checks closely with the corresponding data for other institutions. At Chicago, as elsewhere, Freshmen tend to spend more time on classroom work than do other students (32, 34, 151).

Of those who returned Time Charts some (*e.g.*, because of illness) were found to have incomplete scholastic records, and a number of others for one reason or another (*e.g.*, admission by transfer of credits) had no Mental Test Ratings. Therefore, the net total for whom all three sets of data (Grades, Test Ratings, and usable Time Charts) were available was 1,166 or 46 per cent of all students whose grades and mental test records were complete. The following comparison of Grades and Mental Ratings shows that the students coöperating in the Survey stand slightly higher than the average of the whole student body, both in Grades and in Mental Test Ratings, though not in the correlation between these two measures. The decrease from Freshman to Senior Year in reported Study Time is further internal evidence of the reliability of our Time Chart data. As Grades rise while Time Spent in Study declines, the Survey throws an incidental side light on certain phases of academic grading (155).

THE RELATION BETWEEN GRADES, MENTAL TEST RATINGS, AND STUDY TIME

THE figures for all students for whom the three sets of data are available, as compared with the undergraduate body as a whole, are given below. In this, as in subsequent tables, coefficients of correlation have all been computed by the product moment method and are positive unless otherwise indicated. The Mental Test Ratings of all students were first computed in terms of their standard deviation from the mean; and then expressed in a scale running from zero to 6.0 with the mean at 3.0 (by adding 3.0 to all original $\frac{x}{\sigma}$ measures). This is the familiar distribution embracing a distance of 3.0 σ above and below the mean but for convenience in our study minus 3.0 σ was designated as zero; 0 σ as 3.0 and plus 3.0 σ as 6.0. In the interests of clarity and tabular simplicity probable error values, though originally computed for all our tables, have generally not been included therein, as we feel that they would only complicate the data unnecessarily. The significance of observed differences, in terms of their probable errors, will be given when appropriate to argument based upon such differences.

In all tables the number of cases upon which the analyses are based is given. The standard deviations of groups whose means are compared are also usually included, thus permitting ready computation, if desired, of additional probable error values. Mental Test Ratings are themselves expressed in deviation terms, as just explained. The probable errors of correlation coefficients are included wherever such relationships as they indicate are important.

TABLE IV

Records of Students for Whom Usable Time Chart Records, Grades, and Mental Test Ratings Are Available, Compared with All Undergraduates Whose Grade and Mental Test Records Are Complete

Class	No. of Cases	Average Grades for Semester		Mean Mental Test Rating of Group	Time Reported Spent in Study		Coefficients of Corr. between		
		Mean	S.D.		Mean	S.D.	Grade and Mental Rating	Mental Rating and Time in Study	Grades and Time in Study
1926	221	80.5	5.96	3.16	18.3	7.60	.28	-.15	.00
1927	264	78.3	6.34	3.11	19.5	8.14	.34	-.15	.17
1928	367	76.4	6.66	3.08	20.8	7.44	.39	-.21	-.05
1929	314	75.5	7.00	3.12	23.5	8.02	.45	-.20	-.01
Total for whom all three sets of data are available (a)	1,166	77.4	6.80	3.11	20.7	8.00	.39	-.18	.02
All who returned Time Charts (b)	1,306	77.1	6.38	3.11	20.5	7.86	.40	-.17	-.01
All who returned Questionnaires for whom Mental Test Ratings are also available (c)	1,477	76.9	6.44	3.11	20.5	7.83	.41	.02	-.04
Corresponding data available for all students	2,674	76.5	6.42	3.0			.41		

Scholastic averages in these calculations are those for the semester, in order to correspond as closely as possible with the period for which Time Charts were kept. In other tables where such correspondence was not so important a desideratum, grades for "all work to date" were used as probably affording a more reliable index of scholastic proficiency. For this reason certain of the analyses to follow will not agree exactly with the preceding data as to students' average grades. The semester marks are slightly higher than those for "total work." The superiority in Grades and Mental Ratings of our group coöperating in the Survey over the corresponding figures for all students is so slight that no serious sampling error seems to have been introduced. The correlations also are in close agreement.

VARIATIONS IN THE NUMBER OF REPLIES RECEIVED

IN analyzing the questionnaire and time chart data, an important problem arose out of the fact that different numbers of replies were received to different questions. Two courses were open, in this connection, as to the method most justifiable to follow and likely to yield the

most reliable results. One course was to take the largest number of replies to *all* questions and to base the entire analysis on those cases. The obvious merit of this plan is that answers from exactly the same group of individuals would be utilized in every part of the investigation. The group studied would be uniform throughout and each phase of the Survey would, therefore, reflect the views of the selfsame body of students. This original plan, however, it was found, would necessitate discarding a large number of answers and thus lessening materially the number of cases on which any conclusions could be based.

We have already noted that complete academic records, Mental Ratings, and Time Charts were available for only 1,166 cases; and Table IV above shows that there is practically no difference in academic achievement between this Group (a) and the somewhat larger ones compared with it, representing (Group b) all who returned Time Charts, and (Group c) all who returned either Time Charts or Questionnaires or both. Since some questions were left unanswered by certain students and different ones by others, it is evident, while the total number answering different questions varied, that no constant error of selection was under those circumstances likely to affect the data. Furthermore, the group as a whole was sufficiently large and homogeneous to warrant the assumption that the students answering any given question fairly represented student opinion in general and that such groups differed so little from each other in composition and subjective attitude as to be, for all practical purposes, interchangeable.

After careful consideration and actual analysis of the different groups, it was decided not to follow the method of selecting one absolutely uniform group and limiting the entire analysis to that particular body. There seemed after all to be so little to gain in reliability from this method, particularly in view of the other unavoidable sources of error which in an investigation of this sort are so largely uncontrollable, that adherence to the original plan would, in fact, have been a refinement of no real significance, except in so far as it might have added a superficial appearance of strict methodology to the investigation.

Consequently, the somewhat looser but, it was felt, really more justifiable method to use in this case, was that of utilizing, in analysis of each question, every possible answer, even though that would yield a series of tabulations not agreeing exactly with each other as to the number of cases involved. This method promised to give more truly representative results, based on a larger number of cases, and less subject to possible effect of a sampling error, than did the original plan. In most cases the number of questionnaire answers sufficiently specific to be utilized in the analysis were well over fourteen hundred, with time chart data in general averaging some two hundred fewer cases. The "family income" and "personal expense" questions also, as has been mentioned, were answered by about two hundred fewer students than replied to other queries, but it was fortunately possible to utilize data from other sources, such as the Bureau of Appointments records, scholarship applications, etc., as criteria of these students' economic status in enough such cases to obtain reliable economic ratings for over fourteen hundred individuals.

Some time after the preceding tabulation of replies and discussion pertaining thereto had

been prepared, it was found that twenty-seven of the Questionnaires included in this count had accidentally been destroyed. These were the copies, selected at random from the four different classes, from which certain general comments are quoted, in the Appendix. Therefore, except for the reduction in number of replies to the various questions which were analyzed after the loss occurred, this mishap is probably of little moment. The preceding tabulation has not been corrected for the blanks thus lost since they all had actually been filled in and returned. Except for the comments quoted in this section, however, these questionnaires do not elsewhere figure in the investigation.

The above remarks, perhaps in undue detail, are here made to explain why the largest total number of replies subsequently tabulated in reply to any question is less than the total number of Questionnaires received; and also to account for the differences in the number of replies received in answer to various questions. It is believed that neither of these discrepancies in any serious degree affects the authenticity of our data (144).

FURTHER DATA FROM TIME CHARTS

IN further corroboration of the validity of our Time Chart data the following figures are presented with reference to the reported distribution of time as between Study, Leisure, and Extra-Curriculum Activities and to the relationships between them.

In this, as in subsequent tables, it will be noted that the mean of Time in Activities is considerably lower than that for Time in Study, while the two Standard Deviations are of about the same order. Time in Activities embraces only hours reported spent on organized student pursuits, *exclusive* of self-support employment. The form of this distribution is badly skewed, with a large number of zero cases. This accounts for the approximate equivalence of mean and sigma values in all comparisons of student groups in respect to extra-curriculum participation.

These results are mutually corroborative when the data for different classes are compared, especially with respect to the total for Classes, Study, Activities, and Leisure. Time for sleep and meals, etc., also recorded on the Time Charts, is not here given but accounts for almost all of the remaining hours in the week.

Freshmen apparently spend the smallest amount of time in Leisure (which includes amusements, reading not in preparation of classroom work, "parties," informal discussion, etc.), the average for the class rising each subsequent year. There is a small positive correlation between Mental Ratings and Leisure Time and a negative correlation of about the same order between Leisure and Grades. The figures are interesting in themselves but perhaps particularly so as evidencing that the Time Charts were filled out frankly and candidly. Furthermore, the total time spent in Activities and Leisure is greater than the total time spent in Academic Work for both classes and preparation, which, as a commentary upon the educational situation, perhaps offers particularly convincing evidence of the honesty of student cooperation in this Survey. The report already referred to (32) of Dean Wilkins' Committee at Chicago in general agrees in these respects with our data.

TABLE V
*Reported Distribution of Time, for the Week, by All Students for Whom Usable Time
 Chart Data, Mental Ratings, and Grades Are Available*

Class	No. of Cases	Average Time Reported Spent in Extra-Curricu- lum Activities		Average Time Reported Spent in Leisure		Total for Leisure and Extra-Curriculum		Average Time Reported Spent in Classroom Periods		Total Time for Academic Work		Total Time Reported for Leisure, Extra-Curriculum and Academic Work		Mental Ratings and Leisure Time		Grades and Leisure Time		Grades and Time in Activities		Mental Ratings and Time in Activities	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1926	221	10.0	7.50	36.4	12.45	46.5	46.5	18.3	7.60	35.3	15.0	81.8	81.8	.24	.12	—	.12	—	.06	—	.02
1927	264	9.9	7.82	33.7	12.00	44.6	44.6	19.5	8.14	36.0	16.5	80.6	80.6	.13	.32	—	.32	—	.03	—	.04
1928	367	9.5	7.35	32.6	12.33	43.3	43.3	20.8	7.44	37.3	16.5	80.6	80.6	.18	.12	—	.12	—	.01	—	.03
1929	314	8.9	7.17	31.9	12.30	41.8	41.8	23.3	8.02	39.3	16.0	81.1	81.1	.09	.08	—	.08	—	.00	—	.04
	1,166	9.7	7.50	33.4	12.39	43.1	43.1	20.7	8.00	37.2	16.5	81.3	81.3	.16	.15	—	.15	—	.01	—	.02

Coefficients of Correlation between:

SUMMARY

THE purpose of this and the preceding chapter has been to marshal evidence, both objective and subjective in nature, as to the reliability of data, upon which certain analyses in following chapters will be based. The number of cases investigated varies for different topics in accordance with the number of replies received to the different questions. Over 50 per cent of the student body responded to the more general topics and 45 per cent even to the questions of a personal nature. Those coöperating in the Survey represented a group somewhat superior to the average, but for the following reasons this slight favorable selection in no way vitiates the reliability of our data:

(1) The subjective opinion and judgment of the superior students would presumably have more than average reliability.

(2) The groups subsequently to be compared are subdivisions of the total number coöperating in the Survey, and, therefore, the slightly superior students are compared in various respects with each other, and not (except in a few special instances) with the student body as a whole.

Accordingly we feel justified in concluding from the evidence presented, that our data, based upon evidently interested and frank replies from half of the undergraduate body, voluntarily coöperating in the Survey, accurately represent Yale student opinion. Within the limits of error already discussed and which in such an investigation cannot be avoided, we are confident of the dependability of our data in a major sense.

We are now ready to consider the evidence of individual differences among students in respect to ability, external influences, and incentive or motivation. Variations in experience and study habits, as already explained, we have unfortunately no valid means of determining. The other factors we shall consider in turn, and after discussing their range of variation we shall compare groups of students differentiated in respect to these factors, in the hope of securing information as to their apparent influence. Again, we wish to emphasize, however, that minor irregularities and the interplay of conflicting influences, because of the number of cases involved, will tend to obscure rather than to exaggerate any group differentiations. Accordingly we must depend upon the cumulative evidence presented by consistent, though small, differences in our search for tendencies characteristic of the various factors to be studied.

IV.

INDIVIDUAL DIFFERENCES IN ABILITY

HAVING now stated our general problem and discussed the means of gathering information bearing thereon and the reliability of such data, we may undertake consideration of specific aspects of our investigation. The first step in considering the question of factors of influence would seem logically to be the demonstration of differences observable in such respects. We have postulated existence of demonstrable individual differences in ability, external conditions, and incentive. What is the probable range of variation in each of these factors? To what degree does each appear to influence significantly the scholastic achievement of students?

SELECTION OF STUDENTS AT ENTRANCE

STUDENTS admitted to Yale represent a high degree of selection and a relatively homogeneous group in respect to educational preparation for college work. The 1926 report (49) of the Secretary of the College Entrance Examination Board shows that, of the 4,821 boys taking the Scholastic Aptitude Test in that year, 1,255 designated Yale as the University of their choice. Of these, 805 were admitted by the University. Since 1924, when a limit of 850 students was set to the entering class, the degree of selection, on the basis of College Entrance Examination Board criteria, has risen markedly above the already high level previously maintained at Yale. This is not necessarily an indication of the degree of scholarship in force, but refers rather to academic fitness according to the C.E.E.B. criterion. The percentage of students admitted with one or more conditions has declined of late years as shown below. As "Conditioned" admission was discontinued at Yale in 1926, no figures on the same basis as for previous years are available thereafter.

TABLE VI

Percentage of Yale Freshmen Admitted without Entrance Conditions

<i>Yale Class</i>	<i>Year of Entry</i>	<i>Percentage Qualifying for Admission without Conditions</i>
1924	1920	58.5
1925	1921	68.2
1926	1922	74.3
1927	1923	78.9
1928	1924	91.7
1929	1925	93.5

Judging by this criterion alone, then, we are justified in considering the group of Yale Freshmen as representing a high level of academic fitness as measured by C.E.E.B. tests. The range of average grades on these examinations, although not calculated for all cases, may be judged from the following distributions of 694 cases selected at random from the four classes of 1925, 1926, 1927, and 1929.

INCENTIVES TO STUDY

TABLE VII

*Average Entrance Examination Grades of Yale Freshmen
(Random selection from four entering classes)*

<i>Average C.E.E.B. Grades</i>	<i>Number of Cases</i>
91	2
90	4
88	6
86	21
84	38
82	21
80	88
78	70
76	83
74	91
72	89
70	69
68	57
66	36
64	7
62	6
60	6
	<hr/>
	694
Mean for 345 cases in '25, '26, '27 = 74.2; σ 5.88	
Mean for 349 cases in 1929 = 74.1; σ 5.88	
Mean for total 694 cases = 74.1; σ 5.89	

These data warrant the assumption that entering Yale students are, according to the entrance examination criterion, a highly selected and relatively homogeneous group. Yet the distribution of scores on the Scholastic Aptitude Test developed by the College Entrance Examination Board shows that individual differences exist to a measurable degree *even within the group of admitted Yale Freshmen*. The table on the opposite page gives the Scholastic Aptitude Test scores of all 1,255 candidates for admission to Yale in 1926; and of the 805 of that number who actually entered the Class of 1930. Students previously admitted or entering by transfer from other institutions were not required to take the Scholastic Aptitude Test so that no test scores are on record for the remaining seventy-six members of this class.

Seven thousand seven hundred and ninety College Entrance Examination Board candidates taking the Scholastic Aptitude Test had a mean score of 500.0 with S.D. of 99.8. This indicates that a wide range of ability, as measured by this test, exists even among the students admitted. The variability for the students admitted is so slightly smaller than for all Yale candidates and for all students taking the test as to indicate that the former group, even after being carefully selected according to entrance examination criteria, still reflects widely different degrees of scholastic ability. The mean Scholastic Aptitude Test score of

the Yale students who entered, 525, is superior to that of all students taking the test by only .25 sigma, and the range of variation above and below the respective means is almost as great for the selected group as for the entire number of Yale candidates taking the test. This may be taken as supporting—if such objective confirmation is indeed necessary—our first contention that wide individual differences in potential academic ability exist among such students, even after the entrance selection has been made (42). Much further evidence corroborative of this claim also may be found in the literature regarding intelligence testing of college students. Articles particularly related to this or other phases of the mental testing of college groups are listed under numbers 44 to 74 in the Bibliography.

TABLE VIII

Distribution of S.A.T. Scores of Yale Candidates in 1926 (Class of 1930)

Score	Yale Candidates	Admitted	Entered	Rejected
850	0	0	0	0
825	1	1	1	0
800	0	0	0	0
775	3	3	3	0
750	11	11	10	0
725	12	12	11	0
700	14	11	8	3
675	26	21	17	5
650	36	30	28	6
625	42	32	28	10
600	77	71	64	6
575	85	75	72	10
550	112	86	82	26
525	102	69	65	33
500	133	95	91	38
475	128	81	78	47
450	113	78	75	35
425	77	48	48	29
400	73	43	43	30
375	65	35	35	30
350	56	24	24	32
325	30	9	9	21
300	24	7	7	17
275	16	2	2	14
250	8	1	1	7
225	3	3	3	0
200	4	0	0	4
175	2	0	0	2
150	1	0	0	1
125	1	0	0	1
	1,255	848	805	407
Mean	504	528	525	453
S.D.	105.5	97.5	96.8	104.4

THE ANDERSON CLASSIFICATION TEST

FURTHER evidence of the variability in mental test ratings of our college students appears from consideration of the distribution tables of test scores in the four classes investigated by the Student Survey and from certain other data compiled by Professors L. T. Spencer (45, 46, 47) and John E. Anderson at Yale University. The tests used on these classes were different forms of the Anderson Intelligence test described in previous studies (14, 45). These tests were all given the different classes under the same uniform conditions, at approximately the same time in the Freshman year. Each class was divided alphabetically (to obtain random sampling) into two groups (A-K and L-Z) who took alternate forms of the test in reverse order of halves. Comparison of scores on the two halves yielded a reliability coefficient, for the whole test, of .907. Due to variation in number of elements, crude scores differed from class to class on the tests and for the purpose of this investigation it was necessary to transmute all scores to $\frac{x}{\sigma}$ basis. The following are the distributions of all test scores for each of the four classes, on the scale described on pages 16 and 33.

TABLE IX
Distribution of Mental Test Scores in Four Yale Classes

Score $\frac{x}{\sigma}$	1926	1927	1928	1929	Total
0-0.29	4	—	—	10	14
0.30-0.59	—	—	—	—	—
0.60-0.89	3	16	13	7	39
0.90-1.19	5	9	12	17	43
1.20-1.49	16	11	17	21	65
1.50-1.79	26	38	33	39	136
1.80-2.09	52	41	44	54	191
2.10-2.39	38	48	68	76	230
2.40-2.69	67	68	66	71	272
2.70-2.99	62	78	109	100	349
Mean					
3.00-3.29	65	62	79	103	309
3.30-3.59	64	71	92	103	330
3.60-3.89	51	53	41	65	210
3.90-4.19	46	55	59	60	220
4.20-4.49	21	21	32	35	109
4.50-4.79	16	20	19	26	81
4.80-5.09	2	8	10	17	37
5.10-5.39	11	11	6	—	28
5.40-5.69	—	—	—	—	—
5.70-6.00	2	1	2	6	11
Totals	551	611	702	810	2,674
Means	3.00	3.00	2.99	2.99	3.00

SIGNIFICANCE OF TEST SCORES

WHAT is the significance of these variations in Mental Ratings, with respect to later scholastic achievement? We cannot surely say, to begin with, just what such tests measure, yet we can confidently assert that they measure something positively related to the ability to do college work. In view of conflicting opinions as to just what function is actually tested by this method, there is perhaps no better name for it than that recently adopted by the College Entrance Examination Board—Scholastic Aptitude. At any rate, such tests do differentiate students, even among so relatively homogeneous and specialized a group as Yale Freshmen, selected for entrance by an elaborate battery of examinations, to the considerable degree shown by the tables given above. As to the relationship between such test scores and Freshman Year grades, Table X shows that a moderate positive correlation of about the degree found elsewhere by other investigators obtains between these two sets of measures. As is to be expected, the coefficient of correlation between mental test scores and first year work is higher than that between the same test scores and classroom grades in subsequent years. In fact, the correlation declines steadily, as the time since taking the mental test elapses, due in part to the variability of grades themselves and their relatively low correspondence throughout successive years, for the same individuals. Table X, based on the records of all students at college in 1926 for whom such data were available, illustrates this clearly.

TABLE X

The Relationship between Mental Test Ratings and Freshman Year Grades

	No. of Cases	Coefficient of Correlation between Test Scores and First Year Classroom Grades
Class of 1926 (Anderson Test)	551	.37
Class of 1927 (Anderson Test)	611	.39
Class of 1928 (Anderson Test)	702	.45
Class of 1929 (Anderson Test)	810	.44
Total for 4 classes studied in Survey	2,674	.42
Class of 1930 (S.A.T.)	798	.48

The Relationship between Mental Test Ratings and Subsequent Scholastic Work

Classroom Work upon Which Correlations Are Based	No. of Cases	Coefficient of Correlation between Test Scores and Respective Classroom Grades
Sophomore year grades for Class of 1928	702	.40
Junior year grades for Class of 1927	611	.29
Senior year grades (semester) for Class of 1926	551	.24

Spencer and Anderson (45, 46, 47) obtained, for earlier classes, substantially similar data. Their study also yields valuable information on the correlation between grades for

successive years. The following table from an unpublished report by Spencer gives these figures for the Class of 1926.

TABLE XI
Correlations between Average Grades for Each Year with Every Other Year
(Class of 1926—569 Cases)

	II	III	IV	Total Wk.
I	.708	.659	.563	.832
II		.753	.614	.867
III			.676	.836
IV				.752
				—
				.822

Corresponding data for previous classes have been published (45). One semester's work was found to correlate with the next (taking the average of coefficients for all classes) as follows: for 1925, .79; for 1926, .77. These indices suggest that the reliability of our marking system is somewhat superior to that usually found in studies of college grades. For example, Toops (57), in correlating first and second semester grades as a coefficient of reliability, found the average value, for seventeen colleges, of this index to be only .66.

As grades for total work to date have been used throughout the greater part of our present investigation, the correlations are lowered somewhat by the tendency for individuals' scholastic averages to vary from year to year. The geometric mean of correlations between grades for successive years indicates that the reliability coefficient for "total work" is .72. Application of the Spearman-Brown "prophecy" formula raises this to a maximum of .91 for Seniors (105). Correction for attenuation, taking into account the unreliability both of Mental Ratings and of Grades would, therefore, raise our coefficients by not less

than 11 per cent; *i.e.*, under the most rigorous conditions $r_{att} = \frac{r}{\sqrt{.91 \times .907}}$.

As we have seen, however, the correlations between successive grades vary for the different years so that any such correction practically applicable in the case of groups which include students from all four classes would be only approximate. Our coefficients are all given, therefore, in uncorrected form. The reader wishing to consider what their relative prognostic values might be, if both the marking system and the mental tests correlated perfectly with themselves, may accordingly increase the coefficients and differences noted between them by one-ninth if a rough correction for attenuation is desired.

ANDERSON AND SCHOLASTIC APTITUDE TESTS COMPARED

THE Scholastic Aptitude Test referred to above, developed by the College Entrance Examination Board through two years of research, is generally accepted as one of the best tests of the kind yet constructed. Only one class, 1930, has up to the time of writing com-

pleted a full college year after having taken this test. For the Yale Class of 1930, the correlation of this test with first year grades is plus .48 (Table X). Mention is made here of this simply to indicate that the Anderson Tests (upon which our Mental Test Ratings and dependent correlations are based for the Classes of 1926-1929, inclusive) has shown itself to be approximately as effective in measuring the student's ability to do college work as has the more elaborate and somewhat more reliable Scholastic Aptitude Test. There is further substantial evidence to indicate that even a comparatively short test if properly designed, such as that previously used at Yale, may predict academic achievement nearly as well as will much longer ones (37, 63, 66, 134, 145).

The coefficient of reliability, as calculated for the Scholastic Aptitude Test, is in excess of .95, according to the report of the Commission on Scholastic Aptitude Tests analyzing results of the test for the first year (49). That for the Anderson Test is .907 (45).

It is interesting to compare the correlations above with those obtained for the classes of 1929 and 1930 between Entrance Examination Grades, Mental Ratings, and Freshman Year work. These, for a strictly random sampling in the Class of 1929 and all cases for whom such data were available in 1930 (1,185 cases in all), are as follows:

TABLE XII

Relationship between College Entrance Examination Board Averages, Freshman Year Grades, and Mental Ratings, for Two Yale Classes

Class	No. of Cases	Correlation between Entrance Averages and Freshman Grades	Correlation between Entrance Averages and Mental Test Ratings	Multiple Correlation between Mental Ratings and Entrance Averages (Together) with Freshman Grades	
				Correlation between Mental Test Ratings and Freshman Grades	
1929	348 (random sample)	.45	.32 (Anderson Test used for Mental Ratings)	.44	.53
1930	837	.47	.39 (S.A.T. used for Mental Ratings)	.48	.56

The close correspondence between the correlations for these two classes substantiates further the contention that the Anderson Test used for the classes studied in this Survey is, despite its lower reliability, fairly comparable as a predictive criterion with the S.A.T. subsequently developed. In fact, we find that the Anderson test, our criterion of mental ability in the present investigation, predicts Freshman grades as well as does the whole battery of College Entrance Examination Board examinations and also practically as well as does the more extensive Scholastic Aptitude Test now in use.

The Thorndike, Otis, and other tests have at other institutions yielded similar results (54, 55, 56, 59) which fully justifies the extensive use now made of them at American col-

leges (57, 64). We are, therefore, warranted in placing considerable dependence upon the differentiation, within the Yale Student group, obtained by the Anderson Test scores for the four classes, 1926-1929 inclusive, studied in this Survey.

In Table IV, p. 17, wherein the records of students coöperating in the Survey were compared with those of all undergraduates, coefficients of correlation were given between Mean Grades, Mental Test Ratings, and Time Reported Spent in Study. The table opposite gives partial and multiple coefficients found between these same variables. As in Table IV, the grades data are based upon semester averages.

In explanation of the classification used in this table, the following quotations from the Yale University Catalogue of the Undergraduate Schools (133) are here given:

Yale College offers courses of study in the liberal arts leading to the degrees of Bachelor of Arts and Bachelor of Philosophy.

Those students who have presented the full requirement of Latin or Greek for admission to college and have completed one year of collegiate grade in the subject offered for admission will be candidates for the degree of Bachelor of Arts. All others will be candidates for the degree of Bachelor of Philosophy.

Three-fifths of the work leading to each degree is in the humanities.

The Sheffield Scientific School is the undergraduate school of Yale University for the study of science and engineering . . . The courses are so arranged as to provide for concentration in the principal fields of science and engineering . . . leading to the degree of Bachelor of Science.

The Freshman Year in Yale University is common to both Undergraduate Schools, Yale College and the Sheffield Scientific School. Its function is to prepare first year students for the more advanced work in the two Schools and to assist them in making a wise choice of course.

Official registration of candidacy for any one of the three degrees, Bachelor of Arts (B.A.), Bachelor of Philosophy (Ph.B.), or Bachelor of Science (B.S.), will not be required until the spring of Freshman Year.

These figures were computed separately for each of the three degree groups (B.A., Ph.B. in the College and B.S. in the Scientific School) in each class, but this differentiation between the groups and classes revealed no sufficiently significant differences to warrant its being observed throughout the study.

The slightly favorable selection already referred to (Table IV) and due to the greater interest of abler students in the survey, no doubt accounts for the somewhat higher grades and test ratings of these men as compared with similar figures for the entire student body. It is, therefore, interesting to note, despite their higher grades, that even for this slightly superior group there appears to be practically no relationship between time spent in study and grades reported.

TABLE XIII

Partial and Multiple Correlations between Average Grades, Mental Ratings, and Time in Study for All Students for Whom Such Data Were Available

Class Groups	No. of Cases	Correlation between Grades and Mental Ratings		Correlation between Grades and Time in Study		Correlation between Intelligence and Time in Study		Coefficient of Multiple Correlation between Grades and Combination of Intelligence and Time in Study
		Original <i>r</i>	Partial <i>r</i> (Time in Study Constant)	Original <i>r</i>	Partial <i>r</i> (Mental Test Rating Constant)	Original <i>r</i>	Partial <i>r</i> (Grades Constant)	
1926 B.A.	103	.30	.31	.03	.07	-.12	-.14	.31
Ph.B.	43	.22	.22	-.08	-.08	.01	.03	.24
B.S.	75	.28	.30	.02	.11	-.30	-.32	.30
All 1926	221	.28	.28	.00	.04	-.15	-.16	.28
1927 B.A.	127	.42	.46	.24	.31	-.10	-.23	.51
Ph.B.	56	.24	.28	.18	.23	-.18	-.23	.33
B.S.	81	.19	.21	.07	.12	-.22	-.24	.22
All 1927	264	.34	.38	.17	.24	-.15	-.22	.41
1928 B.A.	166	.40	.44	.06	.21	-.30	-.35	.44
Ph.B.	95	.42	.41	-.08	.02	-.24	-.23	.42
B.S.	106	.27	.26	-.16	-.14	-.08	-.04	.30
All 1928	367	.39	.39	-.05	.04	-.21	-.21	.39
All 1929	314	.45	.46	-.01	.09	-.20	-.22	.46
All students for whom all three sets of data were available	1,166	.39	.40	.02	.10	-.18	-.20	.41

These findings are clearly different from those of May (60) who reports in part as follows: "Correlations between statements early in the semester and after the middle of the semester for hours per week in study correlated plus .86 . . . This item, as given at the middle of the semester, correlated plus .32 with honor points" (p. 433).

Table of Intercorrelation

(Adapted from May, Predicting Academic Success, p. 434)

	Honor Points	Intelligence	Hours per Week of Study
Honor points	1.00	.60	.32
Intelligence	.60	1.00	-.35
Hours per week of study	.32	-.35	1.00

"When we apply the partial correlation method of analysis, the results are surprising. The partial correlation between intelligence and honor points with time spent in study constant is plus .805; with the high school averages constant, plus .532; with units constant, plus .59. The high partial correlation of plus .805 is due to the negative correlation of $-.35$ between intelligence and time spent in study. The brighter they are, the less they study. Thus some bright students will make low grades and some dull students will make high grades by sheer industry. If application to work were proportional to ability, then all correlations between college grades and intelligence scores would rise much higher" (60, p. 439).

Either the situation at Yale in respect to the relationship between Time in Study and Grades is different from that at Syracuse where May's study was made, or else differences in the methods of scoring grades and of analysis of the data are responsible for the conflicting results. The use of average grades may account for our obtaining lower coefficients than May did with Honor Points. Two other possible causes, suggested by Professor May, for lack of correspondence between these two studies are: (1) Greater heterogeneity of the Syracuse group among whom no collegiate selection had yet taken place, as they were all first semester Freshmen. (2) Differences in the methods of computing time spent in study, the Yale students having been asked to record the actual time spent from day to day for *one* week; and the Syracuse Freshmen to estimate the *average* time spent per week in study.

Variations in experience and in study-habits may be sufficiently great to cause the surprising Yale figures and account for this contradictory result. The expectation of raising appreciably the Yale correlation between intelligence and grades, by partialing out the influence of time in study, was defeated by the lack of correspondence between that factor and academic standing. Average study-times of large groups would no doubt still be significant, if the variations in experience and habits among such groups canceled out. Obviously, however, this situation would only reduce the correlations.

The negative relationship between Time in Study and Mental Ratings is also somewhat lower at Yale than May found at Syracuse. In general the two investigations, however, agree as to two sets of correlations (Grades and Intelligence, Time in Study and Intelligence) but differ in respect to the third (Time in Study and Grades). Both strongly emphasize importance of the "intelligence" factor in academic success.

A recently reported study by Jones and Ruch (146) at the University of Iowa tends to agree with our data in this respect. This showed a small negative correlation between hours of study and grade points earned. With intelligence partialled out, this correlation, like ours, was zero. Spence (150) also found Time in Study a relatively uncertain factor in predicting academic achievement.

FURTHER ANALYSIS OF RELATION BETWEEN TEST RATING AND GRADES

WE have also investigated in a somewhat different way the relationship between Mental Ratings and classroom Grades in order to present these results on a basis similar to that

which we shall use later in comparing the records of students grouped according to various differentiations. For this purpose all students for whom Mental Ratings and scholastic records were available were first divided, on the basis of their Mental Ratings, into five groups, one within the middle range of ± 1.6 S.D.; and two each above and below this middle range, each also embracing 1.2 S.D. Thus the lowest group in Mental Ratings are those more than 1.8 S.D. below the mean Mental Rating (0-1.19 on our converted scale); and the next those with Ratings between 1.8 and .6 of the sigma distance below this mean (1.2-2.39 on our scale). Similarly the two upper groups are those between ± 1.6 and ± 1.8 S.D. (3.6-4.79 on our scale)—Group IV; and those with ratings more than 1.8 S.D. above the mean (4.8-6.0 on our scale)—Group V, comprising those highest of all in Mental Ratings. After each individual's Rating on this scale had been computed, the scholastic average of each of these five groups was then calculated. The results appear in the following table.

TABLE XIV

Scholastic Records of Yale Students Differentiated into Five Groups According to Mental Test Ratings

<i>Groups Compared</i>	<i>Range of Group in Mental Rating</i>	<i>No. of Cases</i>	<i>Scholastic Records of the Groups for the Total Work to Date</i>		
			<i>Mean</i>	<i>PEm.</i>	<i>S.D.</i>
Group I	0 to 1.19	96	70.6	$\pm .36$	4.62
Group II	1.2 to 2.39	622	72.7	$\pm .16$	5.66
Group III	2.4 to 3.59	1,260	75.0	$\pm .11$	5.86
Group IV	3.6 to 4.79	620	78.3	$\pm .19$	6.20
Group V	4.8 to 6.0	76	82.5	$\pm .48$	6.84
All students for whom mental ratings and complete scholastic records were both available			2,674	75.4	$\pm .06$
					6.40

The difference of 11.9 in grades, between the highest and lowest groups, equals 1.86 of the standard deviation of the entire grade distribution; and is also about twenty times its own probable error. There is accordingly no doubt as to the significance of the observed differences or, despite the relatively low coefficient, of the relationship between mental test ratings and scholastic work. This correlation when corrected for attenuation becomes about .50 with total work.

SUMMARY

THE foregoing sets of figures demonstrate the validity of our first assumption, that students at Yale do differ widely in respect to academic ability as measured by mental tests, and that the variations in test ratings are positively related to classroom grades in about the degree usually found elsewhere. Mental Ratings also offer approximately as good an index of Freshman Year marks as do entrance examination averages. There is a low negative corre-

lation between Mental Ratings and reported Time in Study for the week; and a surprising lack of any apparent relationship between Time in Study and Grades. This result, we have suggested, may be due to differences in experience and study habits.

The factor of *initial ability* appears, from all of the foregoing considerations, to be perhaps even more important, in respect to academic achievement, than is generally recognized. There is, in fact, little doubt that a student's application and determination alone will not compensate adequately for serious deficiency in scholastic aptitude. As May (60, p. 439) has said, "That general intelligence is the most important single factor in academic success, there is no doubt." This potential ability is measured fairly well by psychological tests. In this respect the Anderson Examination, upon which our Survey Ratings are based, appears to be almost as valid a device as is the present Scholastic Aptitude Test of known excellence.

V.

ECONOMIC AND OTHER FACTORS

ALTHOUGH variations in external conditions—handicaps and advantages—are not so readily measurable, they do obviously exist and influence academic achievement to a considerable degree. It is doubtful whether, even among experienced instructors, the relative external advantages and disadvantages of different students are fully appreciated. The writer has frequently found a teacher scarcely aware of the self-support burden under which some particular student has labored, later realization of which changed considerably the instructor's point of view. Indeed, the scholastic achievement of some students working under great financial handicaps and of others devoting hours daily to some extra-curriculum activity indicates how small a part of their total possible effort is demanded of undergraduates, even at an institution which prides itself on high academic standards. The artificial aids and props resorted to in other cases, to secure entrance and maintain satisfactory standing, also are frequently overlooked. Tutoring in preparatory and college subjects, coaching for examinations, outlines of courses—all these enable the student with money to trade upon the intellectual equipment or diligence of another and frequently to make an appearance of achievement which, without such artificial aid, he might not himself be sufficiently industrious or able to attain. Many a graduate in good standing today would not even have secured admission, let alone qualified for a degree, had he not been in a position to command special assistance at step after step of his school and college course. Every year the Yale Bureau of Appointments is asked to recommend tutors for boys already in college and for others trying to get in, whose parents gladly offer high salaries in return for special coaching, without which the student's case would be hopeless.

Furthermore, when the environmental factors in different homes are also considered—in some cases distinctly helpful to a boy, and in others equally detrimental to his academic advancement—objective confirmation of the importance of external handicaps and advantages may seem almost unnecessary. No doubt other external factors than those we can consider here are also significant and in so far as they cannot be taken into account, our analysis will be incomplete. One such circumstance, which unfortunately does not lend itself to statistical treatment, is the important one of physical differences. Ill health, for instance, may materially affect a student's record. The amount of possible error in the present study on this account is, however, materially reduced through the system in force at Yale, of annual medical examinations and careful supervision of all students' physical condition, by the Department of University Health.

Environmental factors are also extremely difficult to compare and evaluate and in this respect, too, our analysis cannot be carried to ideal lengths. To some extent the effect of environment is being considered in this study, as we compare students from different social and economic levels and from families with somewhat different educational background.

The occupation and income of families is one of several external factors to be considered and in this connection data will also be presented with respect to those students, one or both of whose parents have themselves had a college training.

FACTORS TO BE INVESTIGATED

WE shall see from tables to follow that external conditions do vary considerably for different students. Objective demonstration will be made of wide variations in financial circumstances, and we shall note that, despite what is ordinarily considered a handicap (the necessity for self-support), students working their way actually make somewhat better than average classroom grades. Certain differences noted for groups compared in respect to family occupation and family education will indicate that these variables may also affect scholastic records. Data from our investigation offer, in fact, criteria of differentiation in respect to variations in the following types of external factors of influence: (1) Family income; (2) Own expenses, (3) Degree of self-support, (4) Family occupation, (5) Family education, (6) Family influences, (7) Reasons for coming to college, (8) Degree of student's orientation, (9) Own intended occupation. Other external conditions, such as physique and health, we cannot separately consider and must, therefore, assume that such variations are, for any considerable body of students whose physical well-being is carefully watched by a competent medical staff, not significantly characteristic of any one of such groups more than of any other. Accepting this assumption, how can we examine each of the other external factors and single out its relative significance from that of each of the others and that of initial ability?

Analyses of the records of students comprising these various groups, differentiated with respect to economic and other external factors, show distinct variations in academic achievement. As the groups also differ somewhat in respect to Mental Ratings, and as we have seen that such ratings themselves are positively related to scholarship, it is obvious that we must so far as possible control the effect of this important factor in any group of comparisons. First, therefore, we shall tabulate the Grades and the Mental Ratings of the groups being analyzed, to determine which of these comparisons yield crude differences. Further investigation will necessitate control of the Mental Rating factor within such crude differentiation. To effect this, we shall equalize the Mental Test Rating of each such group by adjusting it to the average Rating of all students under consideration. This should serve to eliminate such group differences as are primarily attributable to initial variations in scholastic aptitude or "intelligence."

EQUATING MENTAL TEST DIFFERENCES

THE method is simple. We shall simply select at random the *largest possible Mental Test distribution*, from all of the students in each group, *which approximates the norm*. As a matter of fact, many of the groups will be found initially normal in this respect, so that this equalizing process may be made without much reduction in numbers or any serious likelihood of distorting our data. If the average Mental Test Rating of any given group is, for

example, a little higher than the norm, elimination of cases above the average, by random sampling, will bring the group down to a standard rating; while an analogous process will raise to the same level those groups initially lower than average. As all of our Mental Test and other data are recorded under the numbers which were assigned to students alphabetically when the Survey was made, and the anonymity of individuals has thus been preserved throughout, sampling by numerical order evidently is wholly at random. When the groups have thus been equated as to Mental Test Ratings, recalculation of average grades should reflect differences due to *other* factors than that of variation in potential ability.

Another complication is the interrelation of external factors, which will, of course, remain even after the groups have been adjusted in respect to initial ability. For instance, the degree of self-support is obviously related to family income and a student's annual expenses are controlled by the total amount at his disposal, whether earned by his own efforts or received from home. Certain of the factors making up the family influence complex are similarly interwoven. We shall, therefore, study the apparent correspondence between such related factors and try to express their combined resultant effect in some common term. Our procedure will, therefore, be as follows:

(1) Analyze the records (academic grades, mental ratings, time reported spent in study, and in student activities, correlations, etc.) of various groups of students differentiated on the basis of questionnaire data and supporting evidence (*e.g.*, Bureau of Appointments records of student earnings, etc.).

(2) Equalize the groups in respect to mental ratings, if necessary, in order to eliminate the effect of differences in potential ability.

(3) Study the mutual interdependence of related factors, so as to express their combined effect, if possible in a single term instead of in several.

(4) Subsequently attempt to evaluate the relative importance of such different factors as still appear significant after these checks have been applied. Once more we repeat that under the circumstances we shall not expect such differences as still remain to be quantitatively large and shall have to rest such conclusions as we may reach upon the consistent and mutually corroborative small variations between the groups compared.

ECONOMIC FACTORS OF INFLUENCE

AMONG these external conditions, the one which we shall consider first is the economic one. Considerable information is available both from the Questionnaire Survey and from the records of the Bureau of Appointments, as to the finances and term-time earnings reported to the Bureau of Appointments from work obtained for students by that office, during the college year 1925-1926, when the Survey was conducted. Therefore, we have objective and reliable data upon which to base our differentiation of students in respect to economic factors.

The Questionnaire data furnish other information, such as the amounts reported spent by these students. For greater reliability of differentiation, local students living at home have been eliminated from certain of these groups.

TABLE XV

Earnings and Expenditures of Students during 1925-1926 as Reported on Questionnaires and to the Student Employment Department of the University

<i>Questionnaire Data (Students Living at Home in New Haven Eliminated)</i>		<i>Bureau of Appointments Data (New Haven Students Included)</i>			
(a)		(b)		(c)	
<i>Reported Expenditures for the Year</i>		<i>Reported Earnings for the College Year (Excluding Vacation)</i>		<i>Reported Earnings for the College Year (Excluding Vacation)*</i>	
<i>Amount Spent</i>	<i>No. of Cases</i>	<i>Amount</i>	<i>Cases</i>	<i>Amount</i>	<i>Cases</i>
\$0-\$500	52	\$0-\$100	104	\$0-\$100	342
\$501-\$1,000	153	\$101-\$400	243	\$101-\$400	503
\$1,001-\$1,500	332	\$401-\$600	49	\$401-\$600	94
\$1,501-\$2,000	284	Over \$600	34	Over \$600	56
\$2,001-\$2,500	230				
\$2,500 up	185				
	1,236		430		995

The Bureau of Appointments list includes practically all of the cases recorded in (b). As this office each year tabulates all reported earnings of self-supporting students, a large number of whom are New Haven residents, we should expect to find, as in fact we do, the number of cases in (c) to be more than twice that in (b). In fact the proportion of all non-local students answering the Questionnaire, who reported term-time earnings, agrees so closely with similar Bureau of Appointments information independently obtained for the whole study body, as strongly to confirm our belief in the dependability of the questionnaire data. It evidences the authenticity of our sample of the undergraduate body replying to the Questionnaire, despite the proportionately greater interest therein previously noted, on the part of students prominent in activities.

On the basis both of Questionnaire data and Bureau records, another series of groups has been compared, that of all self-supporting students, considered in three subgroups according to the degree of their self-support effort. This entire group is not limited only to those who filled out the Questionnaire but includes also those known to the Bureau of Appointments as working their way. Scholastic and Mental Test Ratings are available, from official University records, for all such students, but, of course, the Time Chart records can be presented for only such of them as coöperated in the Survey. Hence the tables below differ considerably from each other in the number of cases recorded in each.

In the following table are given the records for all known self-supporting undergraduates not living at home, whom sufficiently definite data permitted of rating as to their degree of effort expended in remunerative term-time earnings, and for whom Mental Test Ratings and Scholastic Averages were also available (totaling 836 cases in all). These

* Condensed from the Annual Report of the Director of the Bureau of Appointments (15, p. 13; 1926).

records are compared with similar data for all students not earning any part of their own expenses. The self-support rating was determined objectively from Bureau of Appointments records, utilizing also the information from Time Charts in the case of such students as had furnished them. In other words, each case was individually rated on the basis of all available data, and the table shows the resulting distribution, among each self-support subgroup, of all the 836 cases. Group A is that of men who were almost entirely self-supporting and who were necessarily devoting the largest amount of time and effort to outside employment; Group B, those next in financial effort, and Group C, those devoting some definite, but relatively small, time to self-support. The time reported spent in extra-curriculum activities (which do not include employment) and in study consistently increases as the economic pressure lessens.

CORRECTION FOR RANGE DIFFERENCES

IN this and certain of the succeeding tables, relative values of the correlation coefficients would be slightly altered by adjustment for differences in grade variability (probable correction for restricted range as described by Kelly (115) and Toops (132)). For our purposes, however, this step need be taken only when the raw coefficients themselves present significant differences. As our various indices of economic handicap or advantage are subsequently combined into a single Economic Status Rating, correction for differences in range is not here given in connection with each separate economic factor now being analyzed.

As Mental Ratings have been dealt with throughout only in units of deviation $\left(\frac{x}{\sigma}\right)$ the exact S.D. of Mental Test distributions, which in all cases approximates 1.0, is not included in any table. Variations between groups in this respect are too slight to necessitate adjustment for fractional range differences in Mental Ratings.

ACADEMIC SUPERIORITY OF SELF-SUPPORTING STUDENTS

It appears that students working their way are superior to their non-self-supporting fellows in academic records. The time spent in self-support evidently is at the expense of other outside activities rather than of study, although those earning the largest part of their way sacrifice, under economic pressure, some study-time as well. The correlation between Mental Ratings and Scholastic Averages is higher for the *intermediate* self-support groups than it is for those most and least handicapped financially. This is in conformity with the results of a previous investigation reported by the author (14) and described in a later chapter. Certain other studies (40, 75, 79) also agree in general with these findings.

In order to eliminate the possible effect of slight differences in Mental Test Ratings between these groups, they were equated in this respect by the method previously described. The characteristics of the contrasted groups were so little changed by equalizing their Mental Ratings that it seemed unnecessary to reproduce this same table in its adjusted form, especially as the initial Mental Test differences between the two groups were rela-

TABLE XVI

Academic Records of Students Working Their Way (Excluding Those Living at Home), Grouped According to Degree of Self-Support and Compared with Similar Figures for Students Not Earning Any Part of Their Own Expenses

Self-Support Group	No. of Cases	Mental Rating Mean		Average Grades to Date		Correlation between Mental Ratings and Total Academic Average to Date	No. of Cases for Whom Time Chart Records Are Available	Group Average of Time Reported Spent in Extra-Curriculum Activities (Other Than Remunerative Employment)		Group Average of Time Reported Spent in Study		Group Average of Time Reported Spent in Self-Support	
		Mean	S.D.	Mean	S.D.			Mean	S.D.	Mean	S.D.		
A (highest degree of self-support)	133	2.98	77.4	5.95	.42	75	6.40	7.88	20.10	7.55	22.90	8.82	
B	382	3.08	77.8	6.14	.44	204	6.48	7.88	21.45	7.24	17.20	6.50	
C (lowest degree of self-support)	321	3.05	76.4	6.56	.38	160	9.88	9.32	21.16	8.10	6.52	5.28	
	836	3.05	77.3	6.28	.42	439	7.72	8.64	21.08	7.76	15.62	8.46	
All others not earning any part of their own way	1,426	2.97	75.0	6.48	.38	727	9.9	6.84	20.3	8.15			
	2,262	3.0	76.4	6.42	.41	1,166	9.7	7.50	20.7	8.00			

The difference of 2.3 in grades, between self-supporting students and those not earning their own way, is more than 10 times its own probable error, and therefore is significant.

tively unimportant. It was evident from the equated comparison, however, that the difference in academic achievement between self-supporting and other students is not a function in any significant degree of the slight variations in potential ability as measured by Mental Tests.

GROUPS COMPARED AS TO ANNUAL EXPENSES

CLOSELY related to self-support, of course, is the question of expenditure. The wide range of differences in annual expenditure has already been illustrated (Table XV). We find, as might be expected, that analysis of the records of groups so differentiated, in general, corroborates similar data regarding groups compared on the basis of self-support. The two sets of groupings, through part at least of the distribution, are indeed mutually inclusive. The following tables give the data, both before and after equating the expense groups in respect to Mental Test Ratings. As the groups so differentiated originally varied considerably in their mean Mental Ratings, it seemed advisable in this instance to include here both the initial and the adjusted data. The cases of students living at home in New Haven have in both instances been eliminated.

TABLE XVII

Records of Non-Local Students Only, Differentiated in Respect to Reported Annual Expenses

Reported Annual Expense Groups	No. of Cases	Mean Mental Test Ratings by Groups	Average Grades to Date		Correlation between Test Ratings and Grades	No. of Cases Returning Time Charts	Average Time Reported Spent in Activities		Average Time Reported Spent in Study	
			Mean	S.D.			Mean	S.D.	Mean	S.D.
(1) \$0-\$500	53	3.29	79.40	5.32	.36	39	7.56	8.06	23.72	6.80
(2) \$501-\$1,000	145	3.12	76.46	6.40	.48	113	10.66	9.04	22.94	8.50
(3) \$1,001-\$1,500	299	3.08	76.80	6.66	.50	256	9.66	8.26	22.18	7.96
(4) \$1,501-\$2,000	236	3.11	76.52	6.46	.47	215	11.03	9.12	20.02	7.30
(5) \$2,001-\$2,500	216	3.12	76.68	6.32	.40	168	12.06	9.64	17.96	7.22
(6) \$2,500 up	170	3.06	74.7	5.48	.34	139	11.52	8.86	17.34	7.04
	1,119	3.11	76.5	6.34	.42	930	10.74	8.95	20.35	7.61

The grade difference between the lowest and highest expense groups is nearly nine times its own probable error.

It would appear from the first of these tables that a distinctly high level of potential ability is characteristic of the students spending the least money. The superiority of this group over those representing the other extreme represents nearly four and one-half points in scholastic averages—a difference of .7 of the Standard Deviation of the grade distribution. Part of this is due to the greater potential ability of the low-expense group; but the difference is

striking nevertheless. As the second table shows, it is by no means attributable solely to superior academic potentialities. It represents the greater motivation and seriousness of purpose which, naturally no doubt, distinguish the student who is making a very real personal effort to acquire his college training. The steady progression downward in academic grades as the annual expense rises appears distinctly significant.

TABLE XVIII

Records of Non-Local Students Differentiated in Respect to Annual Expenses after Adjustment of Groups to a Common Level in Mental Test Ratings

Reported Annual Expense Groups	No. of Cases	Average Grades to Date		Correlation between Academic Grades and Mental Ratings	No. of Cases Returning Time Charts	Average Time Reported Spent in Activities		Average Time Reported Spent in Study	
		Mean	S.D.			Mean	S.D.	Mean	S.D.
(1) \$0-\$500	35	78.82	5.92	.33	28	9.00	8.50	23.94	6.84
(2) \$501-\$1,000	135	76.72	6.44	.51	96	10.54	8.40	22.64	8.36
(3) \$1,001-\$1,500	297	76.84	6.62	.51	254	9.64	8.22	22.80	8.00
(4) \$1,501-\$2,000	229	76.44	6.46	.47	205	11.16	9.28	20.08	7.34
(5) \$2,001-\$2,500	196	76.58	6.40	.37	148	12.08	9.88	17.94	7.22
(6) \$2,500 up	169	74.96	5.50	.34	135	11.68	8.86	17.44	7.34
	1,061	76.46	6.36	.41	866	10.81	8.96	20.33	7.70

The difference in grades between the lowest and highest expense groups is still over seven times its own probable error.

It is also evident that the students with lowest expenses spend more time in study and less in activities than do their fellows of ampler means and more expensive inclinations. The differences in academic achievement may, therefore, chiefly reflect varying degrees of application. The low correlations between Mental Ratings and Grades for the groups at the two extremes of the expense distribution are also interesting.

FAMILY INCOME DATA

TABLE XIX opposite analyzes the academic records of various groups differentiated in respect to students' estimates of their own family incomes. A clearly bimodal distribution is here evident, among Yale undergraduates, with minimum representation in the two groups with incomes ranging from five thousand to ten thousand dollars per year. It is interesting to note that the average grade varies inversely with the family income, just as it did with respect to annual expenses in the preceding tables. Since expense and income data are, of course, closely related, these results should be, as in fact they are, mutually corroborative. The income groups were first made up inclusive of local students. Removal of the latter

and subsequent equating of the Mental Rating differences so slightly affected the results that only the final figures, for the equated group with local students excluded, are here reproduced. Although the lowest income group has the best scholastic average, the correlation between grades and test ratings is again highest for the intermediate groups.

TABLE XIX

Academic Records of Non-Local Students Differentiated in Respect to Reported Family Income, after Adjustment of Groups to Common Level in Mental Ratings

Income Groups	No. of Cases	Average Grades to Date		Correlation between Test Ratings and Grades	No. of Cases Returning Time Charts	Average Time Reported Spent in Activities		Average Time Reported Spent in Study	
		Mean	S.D.			Mean	S.D.	Mean	S.D.
\$0-\$3,000	150	78.20	5.46	.29	159	5.76	7.26	23.26	7.90
\$3,001-\$5,000	123	77.28	6.10	.50	135	9.66	8.84	20.64	6.94
\$5,001-\$7,000	71	76.80	6.18	.45	77	9.36	9.02	21.54	7.50
\$7,001-\$10,000	86	76.26	5.98	.50	86	8.16	7.34	22.06	8.16
\$10,001-\$15,000	136	75.90	7.20	.47	140	10.98	8.40	20.08	7.08
\$15,001-\$25,000	151	75.64	6.24	.47	143	11.30	9.56	19.24	7.84
\$25,001-\$50,000	153	75.68	6.36	.35	127	10.14	8.88	18.92	7.66
\$50,000 up	122	75.31	6.08	.32	91	12.64	10.06	19.44	7.14
	992	76.4	6.30	.42	958	9.64	8.92	20.64	7.70

The total range of difference in grades, 2.9, equals .46 of the S.D. of the entire grade distribution. This is also nearly ten times the probable error of the observed difference. Particularly significant, as related to grades and the apparent motivation of the groups judging by Mental Test correlations, are the figures on Time in Study and Time in Student Activities.

COMBINING THE ECONOMIC FACTORS

WE thus find certain tendencies in academic achievement apparently related to students' economic status whether that be measured by Family Income, Annual Expenses, or Self-Support. Our next step will be to reduce these three criteria to one comprehensive measure which we shall call the Factor of Economic Status, and which is for each individual—and hence for the groups still to be compared—the resultant of all three of these economic factors just considered.

In order to find a basis for determining objectively the Factor of Economic Status, the relationships between each of these three factors which make it up, Family Income, Annual Expense, and Self-Support, were analyzed. Tables were constructed showing (1) the percentage of self-supporting students in each Family Income and Annual Expense group, and (2) the percentage of each Annual Expense group falling within each Family Income

group. As the primary purpose of these tables was to investigate the interrelationship between the three Economic Factors, in order that they might be methodically combined, they are not reproduced here. The coefficient of correlation for each of these two sets of criteria, as determined by the method of like and unlike pairs, was about .70.

These relationships were studied further by both tabular and graphic methods but it would seem hardly necessary here to elaborate the procedure or details by which the Factor of Economic Status was thereby determined for each individual. The general method was that of rating each student in one of ten categories according to the combined effect of all three factors, objectively combined and weighted according to a schedule determined in accordance with the detailed analysis to which reference has just been made. This redistribution of all such cases, 1,274 in number, was made on the basis of the resultant of all three financial criteria, reduced to one common expression in the Factor of Economic Status. The groups were then equated as to Mental Ratings. This procedure serves two purposes.

First, it enables us further to analyze the student groups whose records we have just been considering, now differentiated with a high degree of reliability on the basis of these several economic criteria combined.

Second, having a definite Economic Status rating for each student permits us to adjust other groups, on the basis of relative Economic Status. Thus not only can various groups be equated for Mental Ratings but also for Economic or Financial Ratings as well. This procedure, therefore, gives us a method of controlling one more of the complex of factors which we are attempting to investigate.

COMPARISON OF ECONOMIC FACTORS

OUR next consideration is the records of students comprising each of the ten Economic Status groups so determined. These are analyzed in the tables following. The first column under the heading "Correlations between Grades and Mental Ratings" gives the uncorrected coefficients; the second, corresponding values after adjusting each coefficient for group differences in grade variability, by the method of "probable correction for differences in range" (115, 132). In this and following instances, where observed differences warrant applying this correction, the adjustment has in every case been made to the S.D. of the entire grade distribution, since this is uniform for all such analyses. The symbol "r" has been used to designate the uncorrected coefficients and "r'" the corresponding values after adjustment for difference in range.

Analysis of the component Economic Factors individually, it will be recalled, showed somewhat higher correlations for groups representing a moderate degree of financial need (whether in terms of Family Income, Own Expenditure, or Self-Support) than did those either above or below them on the Economic Scale. This is in conformity with results of an earlier investigation subsequently to be discussed herein. Here, again, we find our highest correlations in the second and third most handicapped groups. The fluctuations in the size of our coefficients are probably not serious inconsistencies, especially when the weight of other evidence is considered.

TABLE XX

Records of Students Comprising Ten Groups Differentiated According to the Factor of Economic Status (the Resultant of Family Income, Annual Expenses, and Self-Support Data)

Economic Status Groups. (1) Most Handicapped; (10) Most Favored Financially	No. of Cases	Mean Mental Rating of the Group	Average Grades of Groups to Date		Correlations between Grades and Mental Ratings		No. of Cases Returning Time Charts	Average Time Reported Spent in Student Activities Other than Self-Support		Average Time Reported Spent in Study	
			Mean	S.D.	r	r		Mean	S.D.	Mean	S.D.
(1)	44	3.15	78.90	5.70	.39	.43	42	6.46	8.26	23.58	7.44
(2)	147	3.06	77.81	6.28	.55	.55	119	7.80	8.66	22.58	8.72
(3)	152	3.21	77.5	6.20	.49	.49	133	8.48	8.62	21.16	7.74
(4)	112	3.14	76.5	6.18	.47	.48	93	9.8	9.12	21.48	8.18
(5)	137	3.20	76.7	6.58	.39	.37	108	9.1	7.64	21.88	8.16
(6)	156	3.11	76.5	6.54	.40	.39	125	11.62	9.98	20.88	7.12
(7)	179	3.07	76.2	6.48	.45	.44	145	12.	8.40	19.38	7.64
(8)	166	2.94	75.5	6.48	.40	.40	130	11.88	9.50	19.56	7.76
(9)	120	3.05	74.22	5.68	.34	.38	90	12.40	10.08	18.16	8.22
(10)	61	3.01	74.80	5.74	.35	.38	58	12.66	8.24	17.50	6.30
	1,274	3.11	76.56	6.38	.41	.41	1,043	10.32	9.14	20.62	7.98

The grade difference between groups one and ten is approximately seven times its own probable error.

Combination of these ten original Economic Status groups into four broader ones probably gives a truer picture of the situation as a whole, since the resulting combined groups are larger and the probable errors proportionately smaller. The variations within the self-supporting group of course disappear in this step, as do the variations in the correlation coefficients. The observed total difference in academic grades between the two extremes of the scale is also somewhat reduced. Taking both criteria into account (grades and correlations), the total evidence in favor of the more financially handicapped students is equally strong whether we do or do not use the combined groups, and the results are certainly more reliable if we do. These combined results, in the interests both of reliability and of simplification, are therefore given in the next table. To this has been added a tabulation of average Time Spent in Self-Support, merely as of interest in comparison to the times reported for other (non-remunerative) student activities and for study.

TABLE XXI

Record of Students Comprising Groups Differentiated According to the Factor of Economic Status (After Combining the Data from Previous Table (XX) under Four Major Groupings)

Factor of Economic Status	Groups	No. of Cases	Percentage of Total	Group Mental Rating	Average Grades by Groups to Date		Correlation between Grades and Mental Ratings		No. of Cases Returning Time Charts	Percentage of Total	Average Time Reported Spent in Student Activities		Average Time Reported Spent in Study		Average Time Reported Spent in Self-Support	
					Mean	S.D.	r	r			Mean	S.D.	Mean	S.D.		
A (Groups 1, 2, 3 combined) Most handicapped financially		343	27%	3.14	78.00	6.18	.52 ($\pm .03$)	.54	294	28%	7.90	8.62	22.10	8.16	18.1	
B (Groups 4, 5 combined) Somewhat handicapped financially		249	18%	3.16	76.60	6.40	.44 ($\pm .04$)	.44	201	18%	9.42	8.36	21.70	8.16	8.6	
C (Groups 6, 7, 8 combined) Favored financially		501	40%	3.03	75.9	6.52	.41 ($\pm .02$)	.40	400	39%	11.84	9.28	19.92	7.56	3.6	
D (Groups 9, 10 combined) Most favored financially		181	15%	3.02	74.5	5.70	.34 ($\pm .04$)	.38	148	15%	12.50	9.48	17.92	7.62	0.0	
		1,274	100%	3.11	76.5	6.38	.41 ($\pm .02$)		1,043	100%	10.32	9.14	20.62	7.98		

It will be noted that the more financially handicapped students do the better scholastic work, spend more time in study and less in activities, and show a higher correlation between mental ratings and scholastic grades. The difference between the grades of the most handicapped and most favored groups financially is equivalent to .56 of the Standard Deviation of the entire grade distribution, and is also about nine times its own probable error. Combining the groups, though advantageous in other respects, obscures the fact that students *just above* the most handicapped classification show the highest correlation between grades and mental ratings—a tendency which also characterizes the intermediate financially limited groups previously discussed.

If we now equate these groups with respect to Mental Ratings, as we have previously done with the various components of this Economic Status grouping, we should obtain a reliable index of the relationship between financial handicap or advantage and academic achievement. This analysis follows. As a matter of possible additional interest, the correlation between Time in Activities and Time in Study for these equated groups is here included.

TABLE XXII

Records of Students Comprising Ten Groups Differentiated According to the Factor of Economic Status and Equated with Respect to Mental Ratings

<i>Economic Handicap Groups</i>	<i>No. of Cases</i>	<i>Average Grades to Date</i>		<i>Correlation between Grades and Mental Ratings</i>		<i>No. of Cases Returning Time Charts</i>	<i>Average Time Reported Spent in Study</i>		<i>Average Time Reported Spent in Activities</i>		<i>Correlation between Time in Activities and Time in Study</i>
		<i>Mean</i>	<i>S.D.</i>	<i>r</i>	<i>r</i>		<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>	
1	42	78.8	5.78	.37	.40	41	23.94	7.38	6.06	8.24	-.27
2	135	77.9	6.10	.53	.55	109	22.56	8.90	10.18	7.96	-.07
3	141	77.3	6.30	.50	.51	123	21.10	7.76	8.44	8.66	-.12
4	109	76.4	6.26	.45	.46	92	21.50	8.22	9.82	9.16	-.04
5	124	76.3	6.46	.37	.36	97	22.10	8.24	8.92	7.12	.16
6	156	76.5	6.44	.41	.40	124	20.90	7.14	11.64	10.02	-.11
7	173	76.4	6.48	.43	.42	126	19.68	7.68	12.52	8.50	-.03
8	151	75.7	6.50	.39	.38	115	19.62	7.76	12.30	9.78	-.03
9	115	74.2	5.68	.34	.37	95	18.38	8.24	12.60	10.10	-.06
10	57	74.9	5.82	.36	.39	51	17.60	6.94	12.92	8.14	-.21
	1,203	76.5	6.34	.40		973	20.72	8.04	10.70	9.08	-.08

The total range of differences in grade averages, 3.9 points, is .62 of the Standard Deviation of the grade distribution and eight times its own probable error.

Time in Study declines steadily throughout this scale, but Time in Activities, as reported, shows decided fluctuations among the lower numbered groups. This probably represents conflict between Economic and other non-curricular interests among the students of limited means.

Again combining, for greater reliability and simplification, the records of groups analyzed in the preceding table we obtain a final analysis on the basis of Economic Status. This appears on the following page.

TABLE XXIII

Combined Records of Students Comprising Groups Differentiated According to the Factor of Economic Status and Equated with Respect to Mental Ratings

(After Combining the Data from Previous Table (XXII) under Four Major Groupings)

Factor of Economic Status Groups	No. of Cases	Average Grades to Date		Correlation between Grades and Mental Rating		No. of Cases Returning Time Charts	Average Time Reported Spent in Study		Average Time Reported Spent in Activities		Correlation between Time in Activities and Time in Study
		Mean	S.D.	r	r		Mean	S.D.	Mean	S.D.	
A (Combined Groups I-II-III) Most handicapped financially	318	77.9	6.16	.50 ($\pm .03$)	.51	273	22.08	8.22	8.8	8.46	-.13
B (Combined Groups IV-V) Somewhat handicapped financially	233	76.34	6.36	.42 ($\pm .04$)	.42	189	21.82	8.24	9.4	8.16	.05
C (Combined Groups VI-VII-VIII) Favored financially	480	75.90	6.50	.41 ($\pm .02$)	.40	365	20.08	7.62	10.08	9.44	-.04
D (Combined Groups IX-X) Most favored financially	172	75.0	5.68	.35 ($\pm .05$)	.38	146	18.10	7.64	12.2	10.10	-.28
	1,203	76.36	6.34	.40 ($\pm .02$)		973	20.72	8.04	10.70	9.08	-.08

The difference in scholastic records of the most handicapped over the most favored groups financially is still nearly .5 of the S.D. of the grade distribution and more than eight times its own probable error. The differences in correlation, though small, are probably significant in view of their consistency.

The times reported spent in Study and in Activities are also interesting.

THE ECONOMIC STATUS DISTRIBUTION

It will be noted that the Economic Factor Ratings do not follow a normal curve. The bimodal distribution into which they naturally fall represents a true condition. There actually are, among Yale undergraduates, more students of distinctly limited means, on the one hand, and of ample means on the other, than there are lying between these two extremes. Bureau of Appointments Reports over a number of years as to the proportion of self-supporting students at Yale agree closely with these results and thus, as supplementary evidence independently obtained, again tend to confirm the reliability of the Questionnaire data. In this connection, the following comment was made by the Director of the Bureau in his Report for the year 1925-1926, with reference to the information obtained in this Survey regarding family income:

The first group receives aid and thereby partly reduces its expenses; the latter group is sufficiently well off to be able to pay for a Yale education. But to the middle group with incomes of from \$5,000 to \$10,000 a year, the relatively high expenses at Yale make a difference; and that this group has been feeling the burden of high costs here for some time, and perhaps sending its sons elsewhere, is suggested by the relatively small proportion, only 18 per cent, of our undergraduates representing this economic level. We are literally "playing both ends against the middle" and appear to be in danger of splitting our population into two distinct groups, the wealthy and the self-supporting, while nearly eliminating the intermediate class, traditionally the mortar binding the student body into a unitary whole. This middle group, moreover, contains many sons of fathers engaged in the old and honorable professions to whose service Yale has long professed devotion. The desirability of cultivating and encouraging such students should be carefully kept in mind, lest the proportion of boys from these families fall even lower under continued economic pressure (15, p. 6).

If the ten steps in Economic Status distribution are for convenience assumed to be approximately equal, we can, despite this bimodal distribution, determine an arbitrary means of calculating, in terms of deviation, the "Mean Economic Status" of any group of students whose differentiation on some other basis is being investigated. Of course, such an assumption as to the equality of these steps is not strictly defensible statistically but greater refinement of method would, for equally obvious reasons, not be warranted. Therefore, we shall assume that the relative Economic Status of any student may be expressed in terms of his individual deviation from the median of this distribution.

The process of equating various other groups, in respect to Economic Status, will, therefore, be made in much the same manner as was done in equating for Mental Test Ratings. By thus eliminating any variation we may initially find in the Mean Economic Status of groups otherwise differentiated, we can bring under control group differences dependent primarily upon economic factors and thereby also eliminate—at least to any substantial and significant degree—the effect of that particular complex of influences. The necessity of this step for subsequent analyses is in fact our reason for combining the various economic factors into one rating. The effect thereof may be somewhat to obscure certain of the previously noted differences but the method, despite this disadvantage, seems to provide the best means of controlling the important Economic Factor throughout subsequent differentiations.

SUMMARY

(1) IN this section we have presented definite objective evidence of the marked variation in economic status within the Yale student body. This in itself demonstrates our original contention that wide differences exist in external conditions, as we have previously seen that they do in potential ability. In fact, since there is no direct selection on any economic basis among applicants for admission to Yale, the range of variation from complete poverty to affluence is a much wider one than is the range of potential ability, as measured either by entrance examinations or mental tests, both of which are used as criteria of selection.

(2) We have separately investigated variations in Family Income, in Annual Expenses, and in Degree of Self-Support and found mutually corroborative evidence that *economic*

advantage is by no means positively related to academic achievement, and, in fact, that the relationship which might be expected from the term "advantage" is actually *reversed*.

(3) We have equated these various groups in respect to potential ability as measured by Mental Ratings and found that the tendency of the wealthier students to make lower classroom grades appears to be a function of some other factor than that of differences in initial ability. The consistency with which the financial limitations, however measured, appear related to academic superiority is striking and persists even after the check of equating Mental Ratings has been applied.

(4) The resultant influence of economic factors (as measured by the three criteria, Degree of Self-Support, Reported Annual Expense, and Reported Family Income) has been combined into one Factor of Economic Status, after analysis of the interrelation of these component factors, one with the other. On this basis, each of the students for whom definite objective data were available was individually classified in one of ten categories which represented a progressive Economic Status series.

(5) The tendencies noted with respect to Economic Status appear with such consistency, and the reliability of the differences is sufficiently clear, to justify our ascribing considerable force to the Economic Factor and reaching a definite conclusion that the *academic success of students*, as measured by their classroom grades, *is inversely related to their financial "advantage."*

(6) The students working under a financial handicap in general show higher correlations between Mental Ratings and classroom work than do their financially more favored classmates. This is in agreement with previous conclusions published by the author, to the effect that students working their way are more highly motivated than those who are not; and (especially if they are not *overburdened* economically) that both their better scholastic records, and their higher correlation of academic work with Mental Ratings, reflect this superior degree of motivation.

(7) Because of the demonstrated importance of the Factor of Economic Status, we have had to arrange for its control when subsequently studying other groups, compared in respect to the relative influence of other factors. A method of equating such groups with respect to their Mean Economic Status (measured in terms of the deviation of the individuals from the general median) has been selected as the control mechanism. The equating, when necessary, in respect to Economic Status may thus be done henceforth as readily as can the equating for Mental Ratings previously discussed and by a similar procedure.

VI.

FAMILY BACKGROUND

ANOTHER set of external factors is that making up the complex of family environment. Differences of this nature are somewhat uncertain of analysis because, in the first place, the environmental effect itself is the resultant of various factors, and in the second, any attempted classification based on different total sets of such factors is of problematical reliability. We have, in fact, no exact or wholly objective criteria by which the significance of such differentiations can be assured. Two rather general lines of investigation may, however, be followed with some possibility of profit.

The first of these is a classification based upon parents' occupations, and the second deals with the question of relationship between college-trained parents and their sons' academic grades. The Questionnaire Survey made possible a study of the records of several groups of students, so classified. The family occupation groups will be considered first.

The students replying to this set of questions were classed according to parents' reported occupations, and their records analyzed, as set forth in the tables on the next page. When due allowance is made for the rough method of classification necessary in these groupings and for the effect of other influences, economic and otherwise, tending no doubt to obscure the results somewhat, it is perhaps surprising that even comparatively slight differences appear at all, with respect to these groups.

It is interesting to note that the sons of professional fathers (teachers, lawyers, doctors, and ministers) are distinctly superior in test ratings, stand on the whole higher in their college studies, and show distinctly greater correlation between test ratings and academic grades. This is especially noticeable of ministers' sons, who appear to have been somewhat maligned in popular generalization. At all events, differences, small but consistent, do appear both in academic grades and in the reported allocation of time. Previous evidence on this question seems to be rather inconclusive (78, 82, 85, 86).

When we equate the Mental Test Ratings of these groups, we find that the differences noted above between business and professional men's sons remain relatively unchanged. The comparative similarity in academic achievement of the sons of lawyers, doctors, ministers, and teachers, evidenced above, enables us to simplify the following table by treating such men as one group, representative of these older professions. The somewhat superior records made by this group, together with their distinctly higher correlation between Grades and Mental Ratings, suggest superior academic motivation possibly because of intellectual emphasis in the family background of these students. As previously, two indices of the correlation between Grades and Mental Ratings are shown, the column headed "r" indicating the uncorrected coefficients and that headed "*r*" the corresponding values after adjustment for original group differences in range.

INCENTIVES TO STUDY

TABLE XXIV

Records of Students Grouped According to Occupations of Parents

Parents' Occupations	No. of Cases	Mental Test Ratings	Average Grades for Total Work to Date		Correlation between Grades and Mental Ratings	No. of Cases Returning Time Charts	Time Reported Spent in Activities		Time Reported Spent in Study	
			Mean	S.D.			Mean	S.D.	Mean	S.D.
Law	137	3.21	77.94	6.66	.57	121	10.54	9.16	19.70	7.70
Medicine	80	3.15	77.30	6.80	.54	76	9.50	6.56	20.08	7.10
Ministry	29	3.38	79.64	7.06	.57	23	10.04	10.88	23.38	4.82
Teaching	41	3.18	77.14	7.44	.63	39	9.30	7.12	23.52	5.36
Above four professions combined	287	3.20	77.92	6.48	.58	259	9.96	8.86	20.78	7.64
Science and engineering	69	3.11	75.82	5.92	.38	68	9.26	8.22	21.36	6.66
Cultural professions (artistic, literary, music)	25	3.09	74.20	5.88	.62	24	8.24	7.88	18.24	6.60
Business	799	3.06	76.08	6.32	.37	736	10.02	10.00	20.08	7.70
All others (information lacking, incomplete, parents retired or deceased, misc.)	166	3.11	75.22	6.94	.34	157	8.26	8.28	19.86	7.48
Net total	1,346	3.11	76.34	6.34	.41	1,244	9.00	8.86	20.64	7.58

TABLE XXV

Records of Students Grouped According to Occupations of Parents, after Equalizing the Mental Test Ratings of the Respective Groups

Parents' Occupation	No. of Cases	Average Grades for Total Work to Date		Correlation between Grades and Mental Test Ratings		No. of Cases Returning Time Charts	Time Reported Spent in Student Activities		Average Time Reported Spent in Study		Correlation between Time in Study and Time in Activities
		Mean	S.D.	r	r		Mean	S.D.	Mean	S.D.	
Business	799	76.3	6.32	.37	.37	726	9.02	9.00	20.82	7.70	-.13
Professions: law, medicine, ministry, teaching	268	77.8	6.14	.57	.58	252	10.02	8.90	20.84	7.14	-.12
Science and engineering	69	75.82	5.92	.38	.40	65	8.96	8.16	21.92	6.54	-.05
Cultural: writing and artistic professions	23	73.60	5.80	.60	.62	17	8.76	8.44	17.00	5.66	.23
All others: retired and information lacking	166	75.22	6.94	.34	.32	154	7.36	8.32	19.88	7.50	-.12
Total	1,325	76.20	6.26	.41		1,214	9.01	8.84	20.71	7.47	-.10

EQUATING THE MENTAL AND ECONOMIC RATINGS OF CONTRASTED GROUPS

FURTHER adjustment of these groups with respect to their Economic Status shows comparatively little variation. The sons of professional men retain, as a group, superiority in academic records even after both equalization steps have been taken, and we are thus led to the conclusion that a small but reliable difference exists between these groups. It represents about .3 of the standard deviation of the entire grade distribution and is about seven times its own probable error, so that we are justified in considering even this small difference as significant.

The two steps of adjustment, in respect first to Mental Ratings and next to Economic Status, are separately shown in this set of tables, in illustration of the method. As it is necessary to keep Mental Ratings constant when equating for Economic Status, in order to control the effect of both of these influences, it was found advisable to make a "simultaneous adjustment" for both factors so as to reduce as little as possible the number of cases remaining as a basis of comparison between the differentiated groups. This was, of course, done by random sampling, without reference to the individual averages of the students eliminated in the process of adjustment.

In the interests of simplicity and in order to avoid representation of essentially the same data only slightly modified, subsequent analyses will generally be shown only in either the original or in the "double-adjusted" form. Certain group comparisons, however, exhibit initial differences in Mental or Economic Ratings which make it advisable in those cases to present the original as well as the equated figures. The final "Family Occupation" analysis follows.

TABLE XXVI

Records of Students Grouped According to Occupations of Parents after Equalizing Both the Mental Test Ratings and the Economic Status of the Respective Groups

Parents' Occupation	No. of Cases	Average Grades for Total Work to Date		Correlation between Grades and Mental Test Ratings	No. of Cases Returning Time Charts	Time Reported Spent in Student Activities		Average Time Reported Spent in Study	
		Mean	S.D.			Mean	S.D.	Mean	S.D.
Business	775	76.	6.32	.37	743	8.26	8.88	20.80	7.68
Professions: law, ministry, medicine, and teaching	263	77.82	6.36	.53	216	9.40	8.68	21.32	6.80
Science and engineering	61	75.98	6.02	.40	65	8.96	8.16	21.92	6.54
Cultural: writing and artistic professions	22	73.82	5.92	.58	15	8.46	7.20	16.86	5.74
All others: retired and information lacking	142	75.06	6.08	.36	146	7.52	8.50	19.50	7.52
	1,263	76.34	6.32	.42	1,185	9.06	8.90	20.6	7.86

Although the observed grade difference in favor of the Professional group is small (1.8) this is more than six times its own probable error and is therefore significant. The same is true of the observed difference in correlation between grades and mental ratings, for these same groups. It will be noted that no correction for range need be applied to the correlation coefficients for these two groups.

Passing now to the comparison of men whose fathers or mothers, or both, are college graduates, we find that of the total replying to this question, 1,386, almost exactly one-half, come of college-trained parentage on at least one side. Only very small differences are noticeable in the academic records of the various groups analyzed in the following table.

TABLE XXVII
Records of Students Grouped According to Parents' Education

<i>Parents' Education</i>	<i>No. of Cases</i>	<i>Mean Mental Test Rating</i>	<i>Average Grades for Total Work to Date</i>		<i>Correlation between Grades and Mental Test Ratings</i>	<i>No. of Cases Returning Time Charts</i>	<i>Time Reported Spent in Activities</i>		<i>Time Reported Spent in Study</i>	
			<i>Mean</i>	<i>S.D.</i>			<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>
Fathers, Yale men	283	3.18	76.30	6.92	.53	258	10.52	9.68	20.16	7.54
Fathers, other colleges	388	3.12	76.43	6.42	.49	328	10.36	9.28	20.68	7.82
All whose fathers attended college	671	3.15	76.40	6.54	.51	586	10.44	9.46	20.44	7.70
All whose mothers attended college	217	3.24	76.64	6.64	.50	154	9.42	9.30	21.36	6.96
Both parents, college	156	3.29	76.96	6.88	.55	103	9.84	9.52	21.32	6.96
Neither parent, college	654	2.94	76.54	6.16	.33	638	7.86	8.15	20.84	8.06
Fathers only, college	515	3.10	76.50	6.54	.44	483	10.56	9.44	20.26	7.84
Mothers only, college	61	3.06	75.88	5.96	.39	51	8.56	8.80	19.32	6.78
Either parent, college	732	3.15	76.30	6.02	.49	637	10.28	9.42	20.36	7.64
Total (net)	1,386	3.11	76.42	6.38	.42	1,275	9.06	8.90	20.60	7.86

The highest Mental Ratings and the highest Grades, however, are achieved by the group, *both* of whose parents are college graduates. These also show a relatively high correlation. Only in the low Mental Test Rating of the group of students neither of whose parents attended college does any difference of possibly important magnitude appear, and even this does not seem to affect students' grades to any considerable degree. In other respects no differences of note appear between the various groups just analyzed. On the whole it therefore seems from these figures unlikely that students' grades are significantly related to the fact of whether or not their parents are college graduates. Equating these groups in respect to Mental Ratings and Economic Status also proved fruitless of significant differences. Consequently the equated tabulations, which would add nothing to the discussion, have in this instance not been reproduced here.

Huntington's investigation (84) of records of students graduating from Yale College in the classes of 1922 to 1926 also shows relatively little difference scholastically between the

sons of college graduates and those whose parents did not go to college. As this is a study of academic students only, and deals primarily with the relation between various criteria of success and size of families, it offers no data strictly comparable with ours as to relative performance of the total "college-parent" and "non-college-parent" groups. It is, however, interesting to note that the sons of graduates are the more prominent in extra-curriculum activities and received (perhaps for that reason) more votes as to "probable success in after life."

Sons of graduates tend, as shown by Huntington's study, to do better scholastic work if they come from large families; while for students whose parents did not themselves go to college this relationship is reversed. Assuming that the college graduates represent the wealthier family group, a possible explanation of these findings, suggested by our own data previously described, would be (a) that students from the *larger* college-trained families are somewhat more handicapped financially and are the more seriously motivated; but (b) that students in the larger non-college-trained families of presumably lower income suffer from an *excessive* financial burden, which tends to counteract their possibly greater incentive. Thus we might surmise, from Huntington's figures and our own, that the student of a small "non-college" family of limited means is a better scholastic risk than the student from a similar economic and educational level whose family is considerably larger; while from the group representing higher educational and economic levels, the student from a small family (perhaps because of too much attention) does not do as well as the one who, from a large family, is spurred by greater competition.

INTERRELATIONSHIP BETWEEN THESE GROUPS

THE possibility of a significant interrelationship between the "Family Occupation" and "Family Education" groupings was also carefully investigated. As college training is the usual prerequisite for a professional career, and as the father in most cases is the determinant of family occupation, it was natural to find only a small percentage of professional occupations in families where the father had not gone to college. Where the father had gone to college, or still more markedly where both parents had done so, the percentage of "business" occupations was much smaller. In the case of those students whose fathers alone went to college, we found the family occupation divided almost equally between business on the one hand and the four older professions on the other hand, with the balance, representing 20 per cent of the total, scattering. Accordingly no significant relationship between these factors appeared.

A comparison of the family incomes of the business and professional groups and of the degree of self-support engaged in by students whose parents represent these same groups shows surprisingly little difference between them in either case. This, no doubt, is why equating for Economic Status, as we saw in Table X, affected so slightly the previously observed differences between the sons of business and professional men. The following tables clearly illustrate the conformity of these two groups in respect to economic factors.

INCENTIVES TO STUDY

TABLE XXVIII

*Students Whose Family Occupations Fall in Either Business or Professional Groups
Classified According to Family Income and Degree of Self-Support*

Family Income Groups	Parents' Occupations			
	Business		Professional	
	No. of Cases	Per Cent	No. of Cases	Per Cent
\$0-\$5,000	217	29.1	74	25.5
\$5,001-\$10,000	135	18.1	67	23.1
Sub-total of two lowest groups		47.2		48.6
\$10,001-\$25,000	206	27.6	90	31.0
Over \$25,000	188	25.2	59	20.4
Sub-total of two highest groups	746	52.8	290	51.4
Income not reported	106		39	
Total	852		329	
Self-supporting groups				
A	52	6.2	16	5.2
B	119	14.0	40	13.0
C	125	14.7	42	13.4
Non-self-supporting group	287		98	
	565	65.1	231	68.4
Total	852	100.0	329	100.0

As we have seen that family occupation is apparently related in some degree to students' academic records, while the college education of their parents seems to be of little significance in this connection, perhaps the explanation lies in this relatively even division of college-trained fathers between the business and professional careers. At any rate, this study of the interrelation between the education and the occupation of parents in no way refutes the conclusions reached by the two preceding analyses in this section, which may be summarized as follows:

- (1) Sons of doctors, lawyers, ministers, and teachers tend to stand somewhat higher in their college studies than do sons of business men, even after equalizing the contrasted groups in respect both to Mental Test Ratings and to Economic Status.
- (2) Sons of parents who are college graduates do not tend to make substantially better records than do those whose parents did not go to college.

VII.

INFLUENCE OF OCCUPATIONAL PURPOSE

IN the previous section we considered the relation between students' academic grades and their parents' occupation, and have now to study another occupational complex—that of the student's own purpose. The uncertainty of his own occupational decision, as well as his proverbial vacillation in this respect, together introduce complications which somewhat prejudice the reliability of any apparent connection we may discover between the student's own purpose and his academic career. We must indeed admit initially that there are sources of error in undergraduates' subjective estimates of what career they expect to follow, or of what purpose they themselves chiefly had in mind when coming to college. However unreliable such subjective estimates may subsequently appear in the light of occupations and interests actually undertaken in the future, it is nevertheless obvious that what any student, before graduation, *thinks* he is going to do may affect his point of view and degree of motivation during his college course; while what he actually *does* later can have no retroactive effect upon his undergraduate record. Therefore such early, pre-graduation views, however uncertain, are those the student actually holds during the period of his life we are considering. Consequently, whether or not they subsequently become modified, *theirs* is the occupational influence, if any, working upon him during his college days. We shall accordingly try to determine the effect of such influence upon his record.

ORIENTATION RATINGS

To do this it is necessary first to segregate those cases where replies to questions regarding their life purpose were sufficiently complete to offer a fairly reliable basis of differentiation. The total number of such cases was 1,397. A number of questions (*cf.* Appendix B) were asked and each student was rated, as objectively as possible on the Degree of Orientation with respect to life purpose which he seemed to have attained, as judged by his answers.

After a set of objective criteria had been set up, to make the rating of students as reliable as possible, each case was classified as falling in one of the five (A, B, C, D, E) groups, A representing the highest degree of Orientation and E the lowest. Consequently, those in Orientation Group E were such students as had given their future purpose least consideration and were most undecided in reference thereto. After all ratings had been made, the scholastic records of each such group were analyzed.

If we consider first the effect of decisiveness and fixity of life purpose upon academic success, we find in the following table that the scholastic average of students varies directly with the Degree of Orientation. This table also shows the Mean Economic Status rating of each group, on the transmuted scale used for adjusting differences in this respect. The scale units (despite the previously mentioned irregularity of the original Economic Status distribution) may be taken as roughly corresponding in deviation terms to equivalent values on the Mental Rating scale used herein.

In this and the following table, coefficients both uncorrected (designated by "r") and corrected ("r") are again shown.

TABLE XXIX

Records of Students Comprising Five Groups Differentiated as to Degree of Orientation

Group	No. of Cases	Mental Test Rating Mean	Econ. Status Rating Mean	Average Grades to Date		Correlation between Mental Test Ratings and Grades to Date		No. of Cases Returning Time Charts	Time Reported Spent in Activities		Time Reported Spent in Study	
				Mean	S.D.	r	r		Mean	S.D.	Mean	S.D.
A	110	3.17	2.96	78.5	6.88	.57	.54	91	7.4	7.72	21.4	7.52
B	376	3.10	3.10	77.2	6.36	.43	.44	337	9.2	9.10	20.7	7.60
C	458	3.20	3.07	76.0	6.34	.36	.37	410	9.1	8.00	20.5	7.72
D	338	3.06	3.00	75.1	6.20	.40	.41	285	9.0	9.12	20.2	8.24
E	115	2.98	3.06	72.4	6.48	.32	.32	94	9.3	8.76	20.9	7.58
	1,397	3.11	3.04	76.4	6.44	.42		1,217	8.99	8.68	20.5	7.86

Those who came to college with some definite aim, giving the question of a life career and of their fitness therefor serious consideration, and who kept their aims in mind, made definitely superior scholastic records. Those, on the other hand, who had no such purpose made distinctly lower records. The difference in scholastic average between the A and E groups is in fact .95 of the Standard Deviation of the total grade distribution—certainly a significant contrast considering the interplay of other factors of influence. It is also interesting to note that the lowest Orientation group has the lowest Mental Test Rating. Despite this difference in potential ability, however, Orientation is an important independent factor, as was evident when the same groups were compared after adjustment to a common Mental Test mean. We find in fact that nearly the same degree of superiority for the better oriented groups persists, even after the respective mental ratings have been equated. The emphasis placed in recent educational criticism upon the value of purpose and orientation thus appears to be objectively justified by these findings (2, 3, 7, 76, 81, 87).

RELATION BETWEEN ECONOMIC AND ORIENTATION FACTORS

OUR next step was to investigate the possibility of relationship between Degree of Orientation and Economic Status. We might suppose that the man of limited means must have been stimulated by some definite life purpose before assuming the difficulties of working his way through college; while the wealthy student would not necessarily be expected to consider

as closely what career he would follow. The Orientation groups, however, showed but little variation in Economic Ratings and when equated for original small differences in this respect, these groups showed but little change from the previously observed data. Additional information included in the next table compares these "double adjusted" groups in respect also to their reported time distributions. The intermediate analysis, showing the groups equated as to Mental Ratings only, is not here reproduced as it would add nothing to the discussion.

TABLE XXX

Records of Students Differentiated as to Degree of Orientation, after Equating the Groups in Respect to Both Mental Ratings and Economic Status

Group	No. of Cases	Average Grades for Total Work to Date		Correlation between Grades and Mental Ratings		No. of Cases Returning Time Charts	Average Time Spent in Activities		Average Time Spent in Study	
		Mean	S.D.	r	r		Mean	S.D.	Mean	S.D.
A	105	78.1	6.88	.55 ($\pm .05$)	.51	74	7.92	8.04	21.44	7.26
B	345	77.0	6.38	.45 ($\pm .03$)	.44	329	9.14	9.12	20.72	7.62
C	427	75.9	6.24	.38 ($\pm .03$)	.38	380	9.24	8.08	20.46	7.70
D	330	75.4	6.26	.40 ($\pm .03$)	.40	266	9.28	9.26	19.88	8.22
E	109	73.5	6.24	.38 ($\pm .06$)	.38	87	9.14	8.68	20.56	7.52
	1,316	76.3	6.22	.42 ($\pm .02$)		1,136	9.11	8.71	20.38	7.57

The differences previously observed have been slightly reduced by the equating process but still remain distinctly important. The decline in grades throughout these five groups is strikingly consistent, the total range of difference, even after the double adjustment for Mental Rating and Economic Status, still representing nearly three-fourths of the Standard Deviation of the whole grade distribution. It is also eight times its own probable error. The correlation figures are also interesting.

The correlation figures, however, except for the two highest orientation groups, show no important differences. Time reported spent in study and in activities also varies so slightly as to make the range of difference in grades difficult to interpret.

As a possible source of explanation, the marks of Seniors and Juniors from the two highest Orientation Groups were investigated further with respect to individual courses

elected. It was thought that we might find these men making particularly high grades in courses which apparently had a definite bearing upon their intended vocation. Courses in economics, *e.g.*, were for the purpose of this phase of the investigation regarded as having a vocational value for the prospective financier or other business man; courses in history, government, etc., for the future lawyer; certain science courses for the man expecting to enter medicine, and so on. The difficulty of separating the courses taken by each individual into two such categories and of computing averages, weighted as to the number of credit hours for each, was so considerable that this was done for 100 cases only, taken at random from the 210 Juniors and Seniors in the two highest orientation groups. Lower class choices are so largely influenced by curricular requirements as not to lend themselves to analysis on this basis. The results showed very little difference between the grades in vocational and in non-vocational courses; the former averaging 77.7 and the latter 77.2. We cannot be certain, however, that no significant difference exists in this respect, for two reasons: (a) Sheffield Scientific School courses contain so high a proportion of engineering and other vocational material in the two upper classes as to leave relatively little else for the purpose of such comparison. (b) Though College courses, when thus analyzed separately, also showed no significant variations as between the "vocational" and the "non-vocational" categories, these may not have been so classified with sufficient reliability. It is extremely difficult to decide objectively, from the title of any course, what relation to a student's prospective career it may, in fact, assume for him. Variations in the quality of teaching and standards of marking also make any such reliable comparison of grades in particular courses almost impossible. We cannot, therefore, be sure that our negative findings in this respect mean that students who are highly oriented do better scholastic work all along the line and not only in those courses which have a definite bearing on their intended vocation. Such evidence as we have, however, favors this rather than any other interpretation. The higher correlations between Mental Ratings and *total* work to date, shown in the previous table to characterize the students with most definite life purpose, also tend to support this view.

Another possible relationship investigated was that between Parents' Occupations and Students' Orientation. We previously found that the sons of professional men tended to stand somewhat higher in their college work than did the sons of business men. These two latter groups, as analysis showed, distributed themselves so similarly in respect to Degree of Orientation that we found no evidence of any significant relationship existing between these two sets of factors. We can, therefore, conclude that fixity and definiteness of purpose have, of themselves, a definite bearing upon academic success, irrespective of any connection between Orientation and Economic or Family influences.

INFLUENCE OF OCCUPATIONAL INTENT

WE come now to the important question of *direction* of such purpose—*i.e.*, the student's intended occupation. We have seen that to have *some* definite purpose is, from the academic standpoint, advantageous. Is there any further differentiation discoverable with respect to *what* such purpose a student has?

It is apparent that this topic necessitates our untangling an even more complex weave of various factors than that which we have just been considering. From students' statements we can, however, differentiate them into various groups representative of the occupations they expect to enter. Whether or not they actually will enter them eventually, as we have said before, is for the present beside the point, for we are trying to detect the influence upon their academic records of their *present* intentions. But we must be careful after comparing the groups so differentiated to see whether Family Occupation is exerting any disproportionate influence upon one or another of such groups, and also to determine whether a high Degree of Orientation is more characteristic of one such group than of another.

Thereafter lesser complications, such as the influence of family occupation or tradition upon the student's own decision, agreement between that decision and a possible ideal choice entirely unhampered by practical considerations, the question as to whether or not some definite position is awaiting the student upon graduation, etc., remain to be considered.

First, therefore, we present on the following page a comparison of the records of students expecting to enter different occupations.

The small group looking forward to a career in Public Life has an exceptionally high Mental Rating, but stands only slightly above the average in studies. This group has, moreover, such a low correlation between Mental Ratings and Grades that one would judge it to be rather poorly motivated academically. The probable error of this correlation, however, is too great for any reliable conclusions.

The group of students expecting to enter business stands lowest in studies and those planning to teach, highest. This agrees with Bear's report (73) on Centre College Freshmen. There is, in fact, a general agreement between the apparent relationship to academic work of students' *own* expected Occupations and that of their *Parents'* Occupations, since in both cases representatives of the Professional groups make somewhat better grades than characterize the Business groups. Although the original group expecting to enter the professions had a somewhat lower Economic Rating than did the prospective business group, the difference is not sufficiently great to account for the variation in academic achievement of the students in these two classifications. This becomes evident when Table XXXII (p. 63) is examined, showing that the relative classroom standing of these groups is but slightly affected through adjustment to a common Mental Test level and to a mean Economic Status. Figures previously presented in Table XXVI are also given again here, in order to compare the two sets of occupational differentiations—own and parental. For greater reliability, the various Own Occupational Choice groups were each individually equated, before combining them into the broader categories of this table. Consequently the reduction in number of cases, as a result of the double adjustment, is greater than it was for the larger Orientation groups.

TABLE XXXI
Records of Students Differentiated According to Own Vocational Purpose

Vocational Group	No. of Cases	Mental Test Rating Mean		Grades to Date		Correlation between Grades and Mental Ratings		Time Spent in Activities		Time Spent in Study	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Business Professions	485	2.98	75.10	6.34	.39	($\pm .03$)		11.54	9.66	19.96	7.80
Law	194	3.19	77.94	6.94	.40	($\pm .04$)		8.58	7.94	21.26	7.32
Medicine	91	2.95	77.82	6.68	.52	($\pm .05$)		6.14	6.66	22.66	7.40
Ministry	17	3.32	78.30	6.62	.58	($\pm .11$)		11.48	9.88	22.88	7.28
Teaching	65	3.48	79.16	6.16	.43	($\pm .07$)		11.00	8.50	23.18	6.76
Architecture	27	3.24	74.78	6.54	.44	($\pm .11$)		11.56	8.64	20.28	9.32
Total professions	394	3.18	77.90	6.72	.49	($\pm .03$)		8.10	8.08	21.94	7.46
Science and engineering	191	3.30	77.80	6.90	.32	($\pm .04$)		8.66	7.76	19.92	8.40
Arts, music, literature, writing	56	3.30	76.36	5.58	.34	($\pm .08$)		9.98	9.64	18.46	9.04
Politics and diplomacy	20	3.50	76.58	5.78	.16	($\pm .15$)		12.44	8.84	19.22	8.86
Miscellaneous and undecided	217	2.92	74.48	6.46	.40	($\pm .04$)		8.92	8.40	20.80	7.80
Total (net)	1,363	3.12	75.41	6.40	.41	($\pm .02$)		8.94	8.02	20.60	8.02
											.16

No. of Cases Returning
Time Charts

P.M.

S.D.

Mean

P.M.

S.D.

Mean

P.M.

S.D.

Mean

P.M.

S.D.

Mean

P.M.

S.D.

Mean

P.M.

S.D.

Mean

TABLE XXXII

Records of Students Differentiated (a) as to Own Occupational Purpose and (b) as to Parents' Occupations (from Table XXVI) after Equating Both Sets of Groups as to Mental Ratings and Economic Status

<i>Students' Own Occupational Intent</i>						
<i>Group</i>	<i>No. of Cases</i>	<i>Grades to Date</i>		<i>Correlation between Grades and Mental Test Ratings</i>		
		<i>Mean</i>	<i>S.D.</i>	<i>r</i>		<i>r</i>
Business	467	75.11	5.78	.39	($\pm .03$)	.42
Professions	363	78.6	6.58	.48	($\pm .03$)	.47
Science	162	77.5	7.16	.34	($\pm .05$)	.30
Cultural and politics	51	75.2	5.20	.25	($\pm .09$)	.30
All others	206	75.0	4.42	.33	($\pm .04$)	.44
	1,249	76.4	6.38	.40	($\pm .02$)	

<i>Parents' Occupations</i>						
<i>Group</i>	<i>No. of Cases</i>	<i>Grades to Date</i>		<i>Correlation between Grades and Mental Test Ratings</i>		
		<i>Mean</i>	<i>S.D.</i>			
Business	775	76.0	6.32	.37	($\pm .02$)	
Professions	263	77.82	6.36	.53	($\pm .02$)	
Science	61	75.98	6.02	.40	($\pm .07$)	
Cultural and politics	22	73.82	5.92	.58	($\pm .09$)	
All others	142	75.06	6.08	.36	($\pm .05$)	
	1,263	76.34	6.32	.42	($\pm .02$)	

The difference in favor of the Professional and Scientific groups is greater in the case of students' own occupational choice than in the case of Parents' occupations. In the former instance it represents over .5 of the S.D. of the entire grade distribution and is eleven times its own probable error.

OVERLAPPING AMONG OCCUPATIONAL AND ORIENTATION GROUPS

WE thus find two sets of significant occupational data, one pointing toward the conclusion that definiteness of occupational purpose tends to improve the quality of a student's academic work, and the other that Yale students planning to enter certain professions stand somewhat higher scholastically than do prospective business men in the same classes. We have still to determine whether any particular relationship exists between these two sorts of occupational differentiation—*e.g.*, whether those expecting to follow professional careers are also those with a high Degree of Orientation. In other words, are we here considering largely the same individuals, who happen by reason of the nature of their aims also to enjoy more than average definiteness and tenacity of purpose? To this end the number of cases from each Occupational group who fall in each Orientation group has been tabulated. Reduced to a percentage basis for convenience of comparison, the relationship between these two methods of differentiation is presented in the table and chart below. In each case the percentage given represents the proportion of coincidences for each possible pair of groups

out of the total number of cases (1,185) for whom both Orientation ratings and intended Occupational choices in the categories classified were available.

TABLE XXXIII
Students' Own Vocational Choices Compared with Orientation Ratings

Orientation Group	Students' Own Vocational Choice									
	Business		Professions		Cultural Occupation		Science		Diplomacy Politics	
	No. of Cases	Percentage of Coincidence	No. of Cases	Percentage of Coincidence	No. of Cases	Percentage of Coincidence	No. of Cases	Percentage of Coincidence	No. of Cases	Percentage of Coincidence
A	102	15	3.01	51	12.4	6	9.7	30	15.6	
B	365	119	23.9	150	36.4	11	17.71	77	40.1	8
C	430	208	41.7	130	31.6	27	43.6	57	29.7	8
D	268	147	29.4	73	17.7	16	25.8	28	14.6	4
E	20	10	2.0	8	1.9	2	3.2			
	1,185	499	100%	412	100%	62	100%	192	100%	20
										100%

It is evident that students expecting to enter science or other professional callings are as a group more definitely oriented than those expecting to take up business. This is perhaps only to be expected, especially as Orientation ratings were based, as explained, upon the student's fixity of purpose as held before entering college and since maintained. Consequently we are no doubt measuring, to some degree, the same characteristics in the students who have been differentiated in respect to their *Degree* of Orientation and their *particular* occupational purpose. Yet the tables show also that these are by no means identical groupings or rearrangements in different sorts of categories, of the same individuals.

We can only conclude that the factors making for definiteness of purpose are somewhat more pronounced among students expecting to enter professional callings than among those intending to go into business, and that such factors appear to exert a favorable influence upon students' academic records. If, as we believe, the degree of correlation between grades and mental ratings reflects the academic motivation of the contrasted groups, we find herein the probable reason for superiority of students with the most clearly defined occupational purpose.

AN ALTERNATIVE INTERPRETATION

SIMILARLY analysis of the relation between Parents' Occupations and Students' Degree of Orientation, by the same method as that used for the preceding table, revealed surprisingly little relationship between these two factors. This strengthens the probability that the *direction* of a student's own occupational purpose is related to the consistency with which that purpose is held. We may surmise that students with definite professional leanings find more meaning in curricular work and have more appreciation of its values than do those

who come to college either with no definite career in mind or merely with a general expectation of entering some phase or other of the great field of business.

The question may be raised whether, in fact, these data may not be differently interpreted. Possibly the students in our higher Orientation groups, through inclinations manifest in school, may simply represent those of serious classroom purpose who have *thereby* attained a definiteness of orientation. In other words, they may be highly oriented because they are good students, instead, as we have postulated, of making good college records because of their orientation. As our ratings considered early as well as late occupational decision, however, their expressed purpose antedates their college records. Consequently our initial interpretation seems the more likely one. At any rate, the fact remains that superior scholarship certainly tends to be associated with high orientation. Quite possibly the two factors exert a mutually favorable influence upon each other.

VALIDATION OF THE ORIENTATION FACTOR

As further assurance that the five Orientation Rating groups are truly representative of the entire undergraduate sample, the percentages of Freshmen, Sophomores, Juniors, and Seniors in each Orientation category were compared with the percentage of total replies received from those respective classes. This was necessary in order to make certain that the classes were normally distributed throughout the Orientation groups, and that the differences noted in academic records were in no sense a reflection merely of the different scholastic averages for the four years. The following table indicates that no such sampling error of sufficient magnitude to invalidate the results has entered into these differentiations. The Freshmen, as is only to be expected, rated lowest and Seniors highest in Orientation, but the variations between even these classes is small.

TABLE XXXIV

Percentage in Each Orientation Group of Each of the Four Undergraduate Classes, as Compared with the Total Percentage of Replies Received from Such Classes

	Percentage of Total Replies Received from Each Class	Percentage of Each Orientation Group in Each Class				
		A	B	C	D	E
Freshmen (1929)	361 26%	25 7%	80 22%	115 32%	85 24%	38 11%
Sophomores (1928)	439 31%	30 7%	133 30%	139 32%	114 26%	33 7%
Juniors (1927)	323 23%	28 9%	84 26%	113 35%	75 23%	23 7%
Seniors (1926)	274 20%	27 10%	79 28%	91 33%	64 24%	21 7%
All	1,397 100%	110 8%	376 26%	458 33%	338 24%	115 9%

As the only cases of differentiation likely in this way to involve a serious sampling error are those in regard to Own Occupational Choice and Degree of Orientation, such tables are reproduced only for these two groupings. The other grouping lists, however, were similarly inspected when completed, to be sure that no such errors had by any unforeseen contingency been accidentally introduced.

A similar table, of the groups differentiated on the basis of Own Occupational Choice, is here presented. This also shows that the observed differences are not merely a reflex of the variation in scholastic records, of the four classes.

TABLE XXXV

Percentage in Each Own Occupational Choice Group, of Each of the Four Undergraduate Classes, as Compared with the Total Percentage of Replies Received from Such Classes

	<i>Business</i>	<i>Professional</i>	<i>Science</i>	<i>All Others</i>	<i>Total No.</i>	<i>%</i>
Freshmen (1929)	20%	25%	34%	21%	300	24
Sophomores (1928)	31%	34%	25%	38%	396	32
Juniors (1927)	26%	22%	18%	22%	290	23
Seniors (1926)	23%	19%	23%	19%	263	21
	100%	100%	100%	100%		
All	24%	32%	23%	21%	1,249	100

OTHER OCCUPATIONAL ANALYSES

BEFORE proceeding with further analysis of the influence of students' purpose upon their academic records, we shall consider three minor, but interesting, sets of related data dealing respectively with the effect upon occupational choices of (a) agreement of the intended occupation with a possible ideal choice unhampered by material or "practical" considerations; (b) influence of family occupation or tradition; (c) knowledge of some position with family or friends definitely awaiting the student after graduation.

Information with respect to the first of these topics was obtained from students' answers to the following question:

Apart from any question of family influences, economic necessity, etc., what occupation do you think you would most like to follow if you had requisite means and complete freedom of choice?

This question was purposely placed on the blank apart from, and preceding, the battery of inquiries regarding actual occupational intent, so as to be as little affected as possible by student's subsequent consideration of the latter.

The other two analyses were based upon answers to the following questions, which were a part of the aforementioned occupational series:

To what extent was this (Occupational choice) determined, positively or negatively, by family's business or professional connections? To what extent by family tradition or other family influences, not vocational?

Are any positions known to you personally that will probably be available for you upon graduation?
Yes () No ().

The records of those students who answered affirmatively any of these three sets of questions are presented in the following table.

TABLE XXXVI

Academic Records of Students Comprising Certain Special Occupational Purpose Groups

Group	No. of Cases	Mean Mental Test Rating	Average Grades to Date		Correlation between Grades and Mental Test Ratings	No. of Cases Returning Time Charts	Average Time Reported Spent in Extra-Curricular Activities		Average Time Reported Spent in Study	
			Mean	S.D.			Mean	S.D.	Mean	S.D.
Students whose intended occupation is regarded by them as having been influenced by family occupation, tradition, or connections	486	3.12	76.2	6.22	.48 ($\pm .03$)	448	9.9	9.16	20.6	7.72
Students whose actually intended occupation agrees with what their unhampered choice, apart from any practical consideration, would also be	428	3.12	76.7	6.25	.41 ($\pm .03$)	403	9.28	9.20	21.5	7.96
Students who have definite positions awaiting them upon graduation	541	3.07	75.7	6.04	.35 ($\pm .03$)	502	9.35	9.00	19.78	7.66
Averages for all those answering questionnaire and for whom other data were also available	1,477	3.11	76.4	6.44	.41 ($\pm .02$)	1,353	9.51	9.11	20.5	7.83

There evidently is no significant difference between the records of these groups and those of all students answering the Questionnaire. The conclusion follows that these factors, while no doubt playing their part in certain individual cases, are of relatively slight effect upon the group of Yale students considered. We are, therefore, justified in dismissing their possible influence upon the occupational and orientation differentiations which we are now particularly investigating.

PURPOSE IN COMING TO COLLEGE

WE have yet another possible influence to consider in analyzing students' purpose as related to their classroom work, and as a possible factor of academic motivation. Purpose

in coming to college is this factor, which has been studied in the same manner as have the other influences we have just been discussing.

The differentiation in this respect was based upon replies made to the following question: What were your chief reasons, first for wishing a university education, generally; and second for choosing Yale rather than some other college? Indicate by number below which of the following reasons seem to you the three of most importance in each case; write in any others you think should be included.

Because of intellectual curiosity.
 For the prestige of having a Yale degree.
 For general social prestige.
 Because of parents' wishes.
 Because friends were coming.
 To make a good scholastic record.
 Because it seemed "the thing to do."
 Because so urged by previous teachers.
 To prepare for some definite career:
 (a) Professional.
 (b) Business.

Interest in some particular subject of study.
 For development of college friendships and associations.
 Because of specific interest in some other non-athletic extra-curriculum activity.
 To have a good time.
 Because of specific interest in athletics.
 To enable you to make more money.
 To develop your mind.
 To try and "make" some society.
 Because your home was in or near New Haven.
 Because of family tradition.

The following table gives the data for the groups so differentiated, after replies to these various questions had been combined into related categories, and the groups equated for Mental and Economic Ratings. In addition to the data here presented, further analysis along somewhat different lines is given in Appendix D-7, pp. 168-172.

TABLE XXXVII

Records of Students Differentiated According to Stated Reasons for Coming to College, after Equating Mental Test and Economic Status Ratings

Groups	No. of Cases	Average Grades to Date		Correlation between Grades and Mental Rating		No. of Cases Returning Time Charts	Average Time Reported Spent in Activities		Average Time Reported Spent in Study	
		Mean	S.D.				Mean	S.D.	Mean	S.D.
Intellectual interest	131	77.5	5.94	.51	($\pm .04$)	111	7.8	8.16	22.1	8.58
General cultural interest	488	76.9	6.78	.48	($\pm .02$)	426	9.06	9.04	20.9	7.64
Vocational reasons	228	76.6	5.88	.35	($\pm .04$)	181	7.20	7.74	20.5	8.08
Social reasons	255	74.8	5.98	.36	($\pm .04$)	203	10.9	9.26	20.0	7.02
Family reasons	88	75.0	6.12	.29	($\pm .07$)	77	8.46	8.52	21.2	8.32
Total	1,190	76.4	6.34	.41	($\pm .02$)	998	9.06	8.90	20.6	7.86

The original data showed but little difference in Mental Ratings for the contrasted groups. The Economic Status mean of those coming to college for reasons classed above under the head of "Vocational" was somewhat lower than average and their grades somewhat higher (77.8). When the groups were fully equated, however, this academic superiority disappeared, so that it seemed to have been due to economic motivation rather than related to the present basis of differentiation. The low correlation for this group is surprising.

The group attracted by apparently genuine intellectual interests is seen to have, after adjustment, the highest correlation between Grades and Mental Ratings, spends the most Time in Study and least in Activities, and does the best academic work. The differences, however, especially in grades, are so small as to be of questionable significance.

An attempt was made to secure more conclusive evidence in respect to this question by analyzing the groups in greater detail. Separate computations were accordingly made for B.A. and Ph.B. candidates in Yale College and for Engineering and non-Engineering students in the Sheffield Scientific School.

This also proved disappointing except that a higher correlation (.57) was obtained for the B.A. group attracted by distinctly intellectual interests. This further study indicated, as Spencer had previously found (47), that B.A. candidates in Yale College and the Engineering students in the Scientific School somewhat excel Ph.B. and non-Engineering men, both in Mental Ratings and in Grades. There was, however, no evidence that these four degree-groups had so distributed themselves, in answering the question, as to introduce a sampling error. As the distribution in this respect was in fact quite uniform, this detailed analysis, though not yielding data of sufficient importance to reproduce here, proved useful as a further check against the possibility that such a source of error had vitiated our method of differentiation.

This question as a whole, however, yielded less significant results than we had hoped to obtain, perhaps because it was not properly phrased. Certain of the alternate answers suggested were apparently susceptible of varying interpretation by different individuals. Consequently reliable classification of replies proved both difficult and uncertain.

The data suggest that inquiries of this type, more carefully constructed and specifically defined, may have selective value. We cannot feel, however, that this particular question, as it stood, and despite exhaustive analysis, has led to any certainly significant conclusions.

SUMMARY

IN this section evidence has been offered of the relationship between Degree of Orientation and scholastic ranking. Even after equating, in respect to Mental Test Ratings and Economic Status, the groups differentiated on the basis of Orientation toward a life purpose, there remains a striking tendency for the most definitely oriented students to excel in scholarship and in the correlation between Mental Ratings and Grades. This latter coefficient, .55, is sufficiently high to suggest again the academic importance of purposive motivation.

We have also found that the *direction* as well as the *definiteness* of vocational purpose bears a significant relation to scholastic work. Students expecting to enter professional callings (particularly teaching and ministry) excel those planning to enter business, both in scholarship and in the correlation between grades and ratings. They also spend more time in study and less in extra-curriculum activities. The relatively high academic standards for admission to professional and graduate schools may, of course, be a specific factor motivating the students intending to pursue professional careers. As the professional groups appear to be rather better oriented than the business group, there is some overlapping between these two sets of differentiations. Analysis shows, however, that we are by no means merely analyzing identical groups by these two methods.

Such influences as (a) family occupation or tradition, (b) knowledge of a definite position awaiting the student after graduation, and (c) attainment of unhampered choice of an occupation, all fail to give evidence of exerting any effect upon the academic records of Yale undergraduates. Our attempted differentiation on the basis of students' own reasons for coming to college proved relatively uncertain. We may conclude that students who know what they expect to do are better scholastic risks than those uncertain as to their life purpose. Perhaps because of some specific aim which seems to characterize them, those planning to enter the professions tend to stand somewhat higher scholastically than do the prospective business men. None of the other differentiations mentioned above as having been considered in this chapter appears demonstrably related to scholastic achievement.

VIII.

COÖRDINATION OF VARIOUS FINDINGS

WE have now completed the analysis of data regarding various factors whose possible influence upon students' academic work we set out to investigate.

Before proceeding to any discussion of the results, their interpretation, and the conclusions to which they may possibly lead, we must take stock of our findings thus far. Therefore, at this point we shall summarize the differences observed in the various groupings studied, and attempt to arrange them in order of their apparent significance.

We started with the assumption that students differ in respect to potential ability, external handicaps or advantages, and subjective attitudes or motivation. Our first analysis dealt with the demonstrable differences, even among so relatively homogeneous a body as Yale undergraduates, in potential scholastic ability as measurable by Mental Test Ratings. We have seen that such ratings correlate with academic work in college as well as does a whole battery of entrance examinations. Therefore, it proved advisable, in computing the records of groups otherwise differentiated, to provide for control of differences in potential ability by equating their mean Mental Ratings.

We have similarly found that economic factors affect achievement, and, surprisingly enough, that economic advantage is not directly but inversely related to students' classroom averages. Those most handicapped financially, we find, make better scholastic averages than do those of greater means, even after the groups compared have been brought to a common mental test level. In order to control this variable also, we have had to equate groups subsequently studied, in respect not only to Mental Test Ratings but to Economic Status as well.

The various other influences investigated were accordingly first analyzed in their original state; then these same groups were adjusted to a common Mental Test and Economic Status Rating, in order to preclude the possibility of our findings being vitiated by variations in those two factors. While such adjustment tended in some instances to reduce the differences appearing before the process of equating had been applied, in no case did it eliminate them entirely. This was because the originally differentiated groups did not in fact vary sufficiently in their mean Mental and Economic Ratings for adjustment to affect their records materially.

These observed differences, to be sure, were generally small but, as was emphasized earlier, in a study of this character almost *any consistent* difference is significant since the size of the groups considered and the manifold influences at work would make it highly improbable that large variations in scholastic ability would be manifest. We have in this connection to remember that the poorer students had already been weeded out by the process of academic selection. Many had fallen by the wayside from each class studied, as even a number of Freshmen had by April been dropped from college. The student body

at the time of the Survey, therefore, represented an even more highly selected group academically than that resulting from operation of the system of admission by College Board examinations. Therefore the differences noted from within this highly homogeneous group are probably of genuine significance.

It will be recalled that the analyses made in the preceding chapters have revealed significant data as to the groups differentiated in respect to the following characteristics:

1. Mental Test Ratings.
2. Family Income.
3. Own Annual Expenditures.
4. Degree of Self-Support.
5. Economic Status Rating, a resultant of the three factors just named.
6. Family Occupation.
7. Orientation with respect to Life Purpose.
8. Own Occupational Intent.
9. Reasons for Coming to College (of uncertain reliability on the basis of our Survey questions).

The four following sets of differentiations yielded such slight variations in average grades that they were, therefore, dismissed as not of apparently significant influence upon students' academic records.

1. Family Education.
2. Those whose occupational choice has been influenced by family occupation or tradition.
3. Those expecting to follow an occupation as dictated solely by free choice irrespective of financial or other considerations.
4. Those with positions waiting for them upon graduation.

ACCOUNT OF A PREVIOUS STUDY

BEFORE attempting to discuss these data further, however, we shall introduce certain other evidence bearing upon the present discussion. An investigation undertaken in 1925, to which reference has already been made, has previously been reported by the author (14). Though not a part of the present Survey, certain of the conclusions to which it leads will aid in the interpretation of our present findings. Consequently a summary thereof, with tabular analysis of the data, is here given in support and justification of our subsequent argument.

The writer has had occasion in administering scholarship funds at Yale to observe that the system of financial aid there in force operates in a very definite way to motivate students of limited means academically. The amount of tuition aid which a self-supporting student may receive is graded according to his classroom average and since many students are unable to pay their term bills and remain in college without such assistance, they are strongly influenced by economic interests to do as well as possible scholastically.

The 1925 investigation was undertaken for the purpose of analyzing quantitatively the effect of this special motivation factor. Accordingly the records of all matriculating scholarship applicants, in three successive Yale Freshman classes, were compared with those of

students in the same classes who were not expecting to work their way through college. In order to equate the two groups in potential ability each scholarship applicant was individually paired, by random sampling, with a non-self-supporting classmate of equal Mental Test Rating. Thus two groups were obtained from each class, equal to each other in Mental Ratings and each also a representative sample of the entire class, as comparison with class means showed. Analysis of the entrance examination averages of the two groups showed no difference on this basis in their scholastic attainments prior to matriculation. Therefore the inference seemed valid that the contrasted groups were academically undifferentiated at entrance. Yet the Freshman Year averages of the scholarship applicants in all three classes surpassed those of the non-self-supporting students by nearly .7 of the standard deviation in grade distribution. This result indicated that the scholarship candidates, despite the handicap of working their way, clearly excelled their non-self-supporting classmates. The inference is that they were more highly motivated academically, due at least in part to the system of grading financial aid according to scholastic achievement. The correlation between Freshman Grades and Mental Test Ratings was .55 for the scholarship group and .40 for the other students who had been paired with them on the basis of Test scores.

ANALYSIS OF SUB-GROUPS

As a check on the validity of these findings, the scholarship applicants were split up into three categories according to their degree of self-support, as determined objectively from Bureau of Appointments records of student earnings. Sub-Group I represented students devoting not over five hours per week to remunerative employment; and Sub-Group III those working more than thirty hours per week to earn expenses. The remaining Sub-Group, II, consisted of those scholarship men sufficiently in need to be highly motivated by the system of tuition aid but not so overburdened financially as to have their self-support activities interfere unduly with their studies.

This sub-group was presumably the one whose records were most strongly affected by the motivation factor; and if the previously mentioned differences were properly attributable to greater motivation of the scholarship applicants as a whole, then those differences should have become even more pronounced upon comparing Sub-Group II of the scholarship applicants in each class with their respective non-scholarship pairs. The comparison so made substantiated the previous findings. Eighty per cent of the scholarship students in Sub-Group II equaled or exceeded the median of their non-scholarship pairs. Also the correlation between Mental Ratings and Grades for scholarship Sub-Group II (the most influenced group) rose on the average to .65. The following table gives in condensed form the data just discussed.

TABLE XXXVIII

Scholarship and Non-Scholarship Groups of Yale Freshmen, Equal to Each Other in Mental Rating, Compared with Reference to the Correlation between Scores on Anderson Intelligence Tests and Freshman Year Grades. The First Two Columns for Each Class Give Data for the Entire Scholarship and Non-Scholarship Groups: the Last Columns Data for Scholarship Sub-Group II (Those Devoting More than Five, but Not More than Thirty Hours per Week to Self-Support)

		1925			1926			1927		
		Non-Self-Supporting Group	All Scholarship Applicants	Sub-Group II of Scholarship Applicants	Non-Self-Supporting Group	All Scholarship Applicants	Sub-Group II of Scholarship Applicants	Non-Self-Supporting Group	All Scholarship Applicants	Sub-Group II of Scholarship Applicants
No. of cases		184	184	85	186	186	75	204	204	84
Freshman	Mean	69.7	75.5	78.1	70.3	75.0	76.8	71.1	75.7	77.6
Year grades	S.D.	8.0	8.3	7.4	7.8	7.1	7.9	7.6	7.6	7.2
Per cent of scholarship group equaling or exceeding median of contrasted group			76%			75%			74%	
Per cent of scholarship applicants of sub-group II exceeding or equaling the median of their respective non-scholarship pairs				83%			78%			78%
Correlation between Freshman averages and mental test ratings		.46	.66	.70	.39	.55	.67	.33	.44	.57

APPLICATIONS TO PRESENT INVESTIGATION

THE following conclusions, among others, were drawn from this study:

- (1) Greater diligence on the part of self-supporting students may more than offset the financial handicap under which they labor.
- (2) Increased motivation, such as the system of scholarship aid at Yale provides, raises the correlation between Grades and Mental Ratings. This suggests an explanation for the motivating effect we have seen exerted by economic handicaps. It also offers objective support to the theoretical argument that relationship between academic grades and mental test scores becomes more marked when academic motivation is increased.

Paterson (86) and Brigham (48) have evidenced acceptance of this interpretation of our data. Conversely we suggest the argument that among otherwise equivalent groups the *degree of such correlation itself may serve as an index of academic motivation*. Grade differences between otherwise equivalent student groups, when paralleled by corresponding dif-

ferences in the correlation of Grades and Mental Ratings, are, therefore, perhaps explicable on this basis. Whatever may be the underlying or common *cause* of variations in incentive, there is apparent evidence to suggest that their *effect* is jointly exerted upon both correlation coefficients and grade averages. The conclusions from our 1925 study, therefore, suggest and support certain arguments important for interpretation of our later findings. We shall accordingly compare in the following table analogous data from the two investigations.

TABLE XXXIX

Comparison: I, of Data from 1925 Study (Analyzing Records of Scholarship Applicants in Classes of 1925, 1926, and 1927 Contrasted with Those of Classmates Having Equivalent Mental Test Ratings); and II, of Analogous Data from Present Study (Analyzing Records of Students Differentiated in Respect to Economic Status)

<i>Groups Compared</i>	<i>No. of Cases in Each Group</i>	<i>Scholastic Averages</i>	<i>Difference in Average Grades</i>	<i>Fraction of S.D. of Entire Respective Grade Distributions Which These Differences Represent</i>	<i>Coefficients of Correlation between Grades and Mental Test Ratings</i>
(I) From 1925 study (data for three classes combined)					
(a) Scholarship applicants	574	75.4			.55
(b) Non-self-supporting students in same classes, paired with the former on basis of mental rating	574	70.4	5.0	.65 σ	.40
(II) From present study (see Table XXIII)					
(a) Economic Status Groups I, II, and III combined (most handicapped financially)	318	77.9			.50
(b) Economic Status Groups IX and X (most favored financially)	172	75.0	2.9	.46 σ	.35

AGREEMENT BETWEEN THE TWO STUDIES

EVEN though both investigations deal in part with two of the same Yale classes (1926 and 1927) and the Mental Ratings are based in all cases upon variant forms of the Anderson Test, it is nevertheless surprising to find such relatively close agreement between the results revealed by the two studies, which were quite differently conducted. Certainly they tend to confirm each other to a marked degree. Certain points brought out in the earlier study which are also significant for the present one are:

- (1) The higher scholastic records of self-supporting students.
- (2) The higher correlation between grades and test ratings, for students working their way.
- (3) The higher grades and correlations, of those occupying an *intermediate* position within the self-

supporting group as a whole (because those barely in the self-supporting group are less stimulated by serious financial need, while those of greatest need are often too severely handicapped by an unavoidable excess of remunerative employment, to do as well scholastically as they otherwise might).

- (4) Suggestion that the observed differences may be attributed to the greater motivation of self-supporting students, perhaps partly because of their naturally greater seriousness of purpose and in part attributable to specific financial inducements offered by the system of scholarship aid at Yale.

There is a strong recent confirmation of our claim as to the efficacy of this special motivation factor. In 1926 the minimum scholastic requirement qualifying a student to receive tuition aid at Yale was raised from an average of seventy to one of seventy-five, the individual stipend being at the same time considerably increased. The mean grades of scholarship applicants (essentially the same individuals) in the year following this ruling rose three points—no corresponding increase taking place at this time among the rest of the undergraduate body. Such an effect of this University action upon the scholastic grades of several hundred men is, therefore, extremely significant, and appears to corroborate the argument just advanced.

When we compare the coefficients of correlation between Grades and Mental Ratings for the groups analyzed in the present Survey we must realize that as clear-cut findings as those obtained in the previous study of scholarship applicants are hardly to be expected from the more complex problem now under consideration. The Student Survey deals with larger groups, in four classes, and the correlations in the present study are based on "Total work to date," instead of on Freshman Year grades only, as with the earlier one. Certain of the overburdened men whose records were included in the earlier report, as well as many of their non-self-supporting classmates who distinguished themselves chiefly by lack of effort, had been dropped or had withdrawn from college by the time of the Student Survey. The differences noted in Freshman Year records naturally become less marked as the classes are weeded out scholastically and their grade averages include also work taken later in their course.

Nor are we now dealing with as specifically differentiated a group as is represented by the scholarship applicants of the former study. Furthermore, the method of individual random pairing of Mental Ratings which was feasible where the group of scholarship applicants embraced only about a quarter of each class, could obviously not be applied to the present study because it demands a large reservoir of ratings from which the necessary "Pairs" may be drawn at random. The less precise process of equating various Mental Test group means, though the best substitute we could devise for adjusting many different groupings within the same total body of cases, naturally serves our purpose somewhat less satisfactorily. Considering all the circumstances, therefore, it is gratifying that our results on the whole show such consistent agreement.

SIGNIFICANCE OF CORRELATION DIFFERENCES

ARGUMENT based on comparison of certain coefficients around .30 to .40 with certain others ranging from .45 to .55 is of course, speaking in strict statistical terms, questionable when

the probable errors themselves have magnitudes of from .02 to .05. Therefore the differences observed between our coefficients are not enough greater than their own probable errors for the significance of our results to be above challenge. Yet as we have several times pointed out, consistent recurrence of small differences, all pointing the same way, acquires a total cumulative force which we could not justifiably attribute to any of these findings alone and unsupported by others. Furthermore, if the chances are even that one series of coefficients ranges between .45 and .55 ($.50 \pm .05$) and that another ranges between .30 and .40 ($.35 \pm .05$) then even a perfectly sound statistical argument can be made against the probability that *all* the errors in the first series are positive and *all* in the second series negative, and that, therefore, the observed differences are of no significance. We therefore claim, despite the objective uncertainty which consideration of strict statistical probabilities might raise, that our correlation differences, which can hardly represent mere repeated coincidences, have genuine significance.

COMPARISON OF RESULTS NOTED

WE are now ready to assemble the more significant results thus far obtained into a single table. For convenience in comparing the data here collected from various preceding analyses only the most important differences found for various bases of comparison will be represented here. It will be recalled that the contrasted groups in general show a regular progression in respect to academic records. Correlation coefficients vary with somewhat less consistency than do grades, but the comparisons here drawn seem among the most reliable which preceding analyses have yielded. Therefore the simplification of our data in the table below seems entirely justifiable as no serious irregularities in either respect characterize the intermediate groups here omitted. From the Occupational analyses only the comparison between Business and Professional groups is brought forward into this table, since the other categories either yielded no significant data, or included an insufficient number of cases to insure reliability. For the same reasons, we here use the differences noted between the four larger Economic Status groups rather than the somewhat greater variations observed over the entire range of the original ten steps of that differentiation. The analysis of Reasons for Coming to College is included, despite its questionable validity, for whatever it may add to the present discussion.

The different bases of analysis are not strictly comparable statistically, because some represent contrasted parts of continuous series and others arbitrary discrete classifications. Both the number and kind of categories used in the various analyses differ so that no quantitative measure of their relative significance is entirely valid. Though realizing the rather unreliable nature of such an evaluation, we nevertheless may in a rough way compare the various observed differences in respect to their relative magnitude. In the following table this has been done, the actual differences in grade averages between contrasted groups being expressed both absolutely and in terms of the entire grade distribution which each such absolute difference represents. Justification for this basis of comparison rests upon the fact that this Standard Deviation is, for every total group analyzed, the same, as the records

TABLE XL

A Comparison of the Differences thus far Observed in Various Differentiations of Students. The Criterion of Significance of the Influences Analyzed, in Each Case, Is the Fraction of Standard Deviation of the Entire Grade Distribution Represented by the Range of Difference Noted between the First and Last Group in Each Respective Differentiation. The Later Data Represent the Differences Remaining after Equating Mental Test and Economic Status Ratings

Basis of Differentiation and Number of Table from Which Respective Data Are Brought Forward (After Appropriate Adjustments for Mental Test and Economic Status Ratings Have Been Made)	No. of Categories in Respective Differentiations	Mean Scholastic Averages of the Contrasted Groups in Each Respective Differentiation	Spread in Grades, between the Contrasted Groups	Fraction of S.D. of Entire Grade Distribution, Represented by Spread between Average Grades of Contrasted Groups	Significance of Observed Grade Differences, in Terms of Their Own Probable Error Quotients, i.e., Difference ÷ P.E. of Difference	Average Time Reported Spent in Activities	Average Time Reported Spent in Study	Correlations for the Contrasted Groups between Mental Test Rating and Total Academic Work	Significance of Observed Differences in Correlations, in Terms of Their Probable Error Quotients, i.e., Difference ÷ P.E. of Difference
Mental Test Ratings (Table XIV)									
Highest group (4.8 to 6.0)	5	82.5	11.9	1.86 σ	2.0				
Lowest group (.0 to 1.19)		70.6							
Orientation (Table XXX)									
First group (highest degree of orientation)	5	78.1				7.9	21.4	.55	.51
Last group (lowest degree of orientation)		73.5	4.6	.74 σ	8	9.1	20.5	.38	.38 2
Own Occupational Purpose (Table XXXII)									
Professional group	5	78.6				8.1	21.9	.48	.47
Business group		75.1	3.5	.55 σ	11	11.5	20.0	.39	.42 2
Economic Status (Table XXIII)									
Ratings (resultant of three previous differentiations)	4								
First group (least favored financially—original I, II, and III combined)		77.9				8.8	22.1	.50	.51
Last group (most favored financially—original IX and X combined)		75.0	2.9	.46 σ	8	12.2	18.1	.35	.38 2
Family Occupation (Table XXXII)									
Professional group	5	77.8				9.4	21.3	.53	.53
Business group		76.0	1.8	.27 σ	6	8.3	20.8	.37	.37 5
Purpose in Coming to College (Table XXXVII)									
Intellectual interest group	5	77.5				7.8	22.1	.51	.53
Mean of other groups		76.2	1.3	.21 σ	2	9.4	20.4	.30	.30 2

of a substantially identical group of individuals have been analyzed on the various bases here compared. Therefore, despite the statistical impropriety of this procedure, we believe it has an actual common-sense significance for the bases of classification actually used herein. The correlation coefficients for the contrasted groups are also, and on like grounds, presented in the table, both original ("r") and corrected ("r'") coefficients being shown.

CONCLUSIONS FROM THESE DATA

WHAT conclusions may we now logically draw from this collection of data? Can we hope to find therein any basic principles of general applicability to the topic of academic motivation?

First of all we may conclude that no single factor, among all those analyzed thus far, apparently influences the grades of these students, who have already been selected for admission to college, in anything like the same degree as does their potential ability. As this scholastic ability or aptitude is measurable by mental tests as well as by entrance examinations, it seems evident that both such measures should be given careful consideration as entrance criteria. In fact we believe that mental tests may well be accorded greater weight in this connection than has heretofore been allowed them, as least by Yale. To admit applicants rating distinctly low on such tests, particularly to an institution whose enrollment is limited, certainly appears to be a procedure of questionable educational propriety.

Next it seems reasonable to suppose that the other factors of influence mentioned above, and whose relation to academic achievement seems significant, may also prove useful secondary considerations in the selection of students. We, therefore, feel that information regarding the definiteness and direction of a student's occupational purpose is a legitimate supplementary admission criterion. We do not, of course, advocate depending primarily upon such indices. It seems probable, however, within a group measuring up satisfactorily in other respects, that the process of selection may be improved and the quality of subsequent scholastic attainment raised, by giving attention to such factors as evidently exert a demonstrable influence upon academic work in college.

Our answers to the first questions raised in the initial chapter may, therefore, on the basis of this analytical investigation, be briefly stated as follows: In the process of selective admission, and as evidence supplementary to other criteria, greater consideration than has heretofore been customary may safely be given to (1) a student's mental test rating; (2) his economic status; (3) definiteness of his life purpose; (4) professional aim or background.

It is important to remember, in connection with the operation of economic factors, that *excessive* financial handicap may overcome the greater motivation generally characteristic of students who work their way through college. The amount of employment available in many localities is limited and, therefore, admission of more self-supporting students than the community can reasonably sustain must be guarded against. Since part of the economic incentive depends upon opportunities for securing financial relief through student-aid funds, the scale of individual scholarship stipends and the academic qualifications for such assist-

ance should both be kept sufficiently high to facilitate real motivation. Too much assistance, by eliminating the element of competition, may also defeat its own ends.

MOTIVATION THE BASIC INFLUENCE

If we now ask *why* the factors in question exert this influence, our data at least suggest one apparently consistent and probable answer. Following the argument developed in the 1925 investigation and placing an analogous interpretation on our later results, we venture to attribute the observed differences chiefly to the *varying degrees of academic motivation* characteristic of the factors studied. If the explanation is valid, it means that students' motivation and consequent scholastic proficiency may in some degree be stimulated through selection and control of these factors of influence.

Considering the size of these groups and the interplay of other factors which naturally tend to obscure such differences, the consistent variations noted in academic achievement certainly seem significant. The small but also rather consistent differences in correlation which parallel these grade data strongly support the explanation offered. To substantiate the argument thus based upon our previous conclusions, we have striking evidence in the rise of three points in average grades of scholarship applicants, following an increase in the University standards of academic qualification for such assistance.

It is recognized that this claim has by no means been irrefutably demonstrated. The higher correlations between Grades and Mental Ratings characterizing certain groups, taken by themselves alone might, as we suggest, evidence higher motivation. On the other hand they might merely indicate that the groups in question perform more in accord with academic prediction, because economic or other considerations leave them comparatively less time for study. When the higher correlations for certain groups otherwise undifferentiated are considered in conjunction with the higher average grades achieved by these same groups, however, the presumption becomes strong that genuinely higher academic motivation is the logical explanation of these two types of observed differences. Whether or not our claim in this respect is valid, moreover, the very fact of the higher grades and correlations obtained for certain groups indicates, whatever their cause, that significant scholastic characteristics make the bases of differentiation studied of real academic importance.

Further testimony as to times reported spent in study and in student activities, for the various groups analyzed, gives additional force to our claims. Finally we have mutually corroborative data from two quite independent studies, differently conducted, which argues in favor of the reliability of both investigations, and the validity of our explanation of one by deductions drawn from the other. Consequently we feel justified, taking all these bits of evidence into consideration, in concluding that the differences noted above are largely traceable to varying degrees of motivation for which the factors of influence studied are responsible.

Thus far we have dealt chiefly with students' academic records. Before reaching final, and possibly more basic interpretations of these results, we shall find it profitable to examine also certain data concerning the influence of extra-curriculum activities.

SUMMARY

WE have reason to believe that the following factors are related in a significant degree to academic achievement in college. They are here arranged in the order of apparent relative importance, as indicated by our analyses.

1. Potential ability, as measured by Mental Tests.
2. Degree of Orientation, or definiteness of Life Purpose.
3. Expectation of entering upon a Professional Career.
4. Economic Status, in part because of the specific motivation induced by high scholastic requirements for financial aid.
5. Influence of Parents' Occupations.
6. Possibly, students' Own Purposes in Coming to College.

Comparison of the data from two studies, differently conducted but mutually corroborative, led us to attribute the effect of such forces (other than that of potential ability) upon students' grades, to variations in academic motivation. Grades and test correlations alike suggest that motivation, and therefore the academic consequences thereof, are both influenced by these factors. Therefore we suggest that these may properly be given consideration as supplementary to other entrance criteria in selecting students for admission to college. The first two factors listed above should prove particularly useful in this connection.

These conclusions bring the first part of our investigation to a close. We shall now attempt, through other means, to interpret their significance along somewhat broader lines.

IX.

MOTIVATING EFFECT OF STUDENT ACTIVITIES

WE have hitherto considered the effect of certain external factors upon academic motivation of college students, as revealed by analysis of their Mental Test Ratings and classroom records. It is probable that incentives to study are in some cases relatively direct, as when the intellectual curiosity of the student has been sufficiently aroused so that he is genuinely athirst for knowledge—such a situation with undergraduates is as rare as it is ideal. Again, even if not intellectually curious in general, a student may develop real interest in some particular study or subject. Here is a powerful lever with which, as we all know, the wise and sympathetic teacher may work wonders. Any real interest or motive, we venture to suggest, may have true educational value if properly utilized and integrated. It is necessary now to consider particularly the effect of distinctly *secondary* incentives—as when the student is not primarily motivated by desire for learning, but still wishes to do at least reasonably well in studies because the realization of some other aim is partly conditional upon his classroom record. The effect, for instance, of scholarship aid as such a specific motivating influence upon a substantial number of students at Yale has already been discussed at length.

CLASSIFICATION OF EXTRA-CURRICULUM PARTICIPANTS*

LET us consider a related case of secondary or conditioned motivation—the extra-curriculum activity. Information concerning participation in such activities was for this part of the study not confined to students returning Questionnaires, but obtained about all undergraduates. As we have noted, the Time Charts furnished such data from nearly half of the students. The names of other participants in activities of various kinds, athletic, dramatic, editorial, etc., were secured through the official lists of these organizations and further names were obtained from them, of the competitors for insignia. By combining the data from both sources a list of students associated with the different activities was compiled. While probably not every individual received due credit for his extra-curriculum achievement, a check-up through the records of the organizations themselves, class books, etc., has reduced the probability of significant errors or omissions to a minimum. Furthermore, in view of the results set forth in the table below, it is only reasonable to suppose that any omissions from the group of extra-curriculum participants would tend to reduce and not to exaggerate the observed differences.

The criterion for inclusion in the group of extra-curriculum participants was either some definite achievement or a certain amount of consistent effort on the part of those competing for such recognition. The individual who had made only sporadic and half-hearted attempts

* The material of this chapter appeared in substantially the same form in an article previously published by the author in *The Personnel Journal* (1933).

to "go out for" them and who abandoned these pursuits readily, has accordingly not been included as a participant in student activities. The extra-curriculum pursuits considered have also been limited to those which are definitely recognized and organized, thus eliminating purely social or ephemeral interests.

ACADEMIC RECORDS OF STUDENTS IN ACTIVITIES

THE groups differentiated in Table XLI are so large and vary so slightly with respect to Mental Ratings that it seemed unnecessary to adjust them in this respect. As we are comparing the records of self-supporting and non-self-supporting students in both the groups, adjustment to a common level of Economic Status was also out of the question.

Our first analysis of the student activity groups considered all these together. A further differentiation is subsequently presented of the records of students in certain of the more important specific activities.

Average Grades, Mental Test Ratings, and correlations between the two are available for almost all students whether or not they are engaged in such activities. We also have, from the Bureau of Appointments, quite complete data regarding men earning their own expenses, so that it is possible furthermore to separate out the latter from both activity and non-activity groups. Our records thus enable us to study self-supporting students as in a sense a control group, in analyzing the particular form of secondary motivation now being discussed.

The table given below presents a comparison between students in extra-curriculum activities and those not so engaged, with the self-support element singled out from each group. As this is based on Yale students solely, its implications, if any, for other institutions would of course depend in part on student attitudes in general and in part upon the similarity of eligibility regulations, both for athletics and for other organized activities. A more searching analysis on the basis of degree of extra-curriculum achievement is projected; the present study does not discriminate between the "big men" of the campus and those whose more moderate participation in activities has been just sufficient for their inclusion in the extra-curriculum group.

We find, comparing first all in extra-curriculum activities with all not in such activities, that the former are slightly superior in Mental Ratings, more so in classroom Grades and still more in correlation between the two. The difference in Test Ratings amounts to only .07 S.D. and that in Grades to about .30 S.D. The differences of note are all more than ten times the respective probable errors and may therefore be regarded as significant.

There is, however, more to be observed if we examine separately the self-supporting and non-self-supporting students. We find for instance that men who are working their way through college make about the same grades whether they are in other extra-curriculum activities or not. The correlation is distinctly higher for those in activities but the other differences within this self-supporting group are relatively small. But if we note those not self-supporting similarly differentiated, we find very considerable differences in grades as well as in correlations.

It should again be noted that this particular analysis deals with the entire undergraduate

body, and not simply with those students replying to the Questionnaire. The slight superiority in Grades and Test Ratings of those coöperating in the Survey may be due to the greater proportion of replies received from students in activities who, as we have just seen, stand somewhat higher scholastically than do those not so engaged.

TABLE XLI

Students in Classes of 1926, 1927, 1928, and 1929 in Extra-Curriculum Activities Compared Scholastically with Those in Same Classes Not So Engaged

	No. of Cases	Average Classroom Grades for Total Work to Date		Average Mental Test Rating	Correlation between Mental Ratings and Grades	
		Mean	P.E.m.			
All students in extra-curriculum activities	1,244	76.4	$\pm .12$	3.04	.46	($\pm .01$)
All students not in extra-curriculum activities	1,399	74.6	$\pm .12$	2.97	.30	($\pm .02$)
Self-supporting students in activities	407	77.1	$\pm .22$	3.06	.49	($\pm .02$)
Self-supporting students not in activities	403	76.8	$\pm .21$	3.00	.33	($\pm .02$)
Non-self-supporting students in activities	835	76.0	$\pm .14$	3.02	.44	($\pm .02$)
Non-self-supporting students not in activities	996	74.0	$\pm .13$	2.95	.29	($\pm .02$)
All students in activities or self-supporting or both	1,647	76.5	$\pm .11$	3.03	.43	($\pm .01$)
Students neither in activities nor in self-support	996	74.0	$\pm .11$	2.95	.29	($\pm .02$)
Total for whom complete data are available	2,643	75.4	$\pm .09$	3.00	.41	($\pm .006$)

The standard deviation of these grade distributions ranges from 6.2 to 6.6.

THEY TOIL NOT, NEITHER DO THEY SPIN

OF the total group, 1,399, not in extra-curriculum activities, a considerable proportion are not so engaged because they are too much occupied in working their way. Are the rest of this group, who are not deterred from participation in activities by reasons of self-support, staying out of such pursuits in order to devote the time to study? Some no doubt may be, but the majority apparently are of different caliber; for if we observe specifically the substantial number who are *neither in activities nor self-supporting* we find that these are the poorest students of all. In other words some of those not in activities are in that category because they are workers (either due to study or to self-support or both) and others apparently because they are quite the reverse.

If we combine all those who are in extra-curriculum activities or in self-support or in both—that is, all the men whom we know to be carrying some outside effort in addition to their studies—and compare them with the remainder, who, according to Time Chart or Questionnaire replies, have no activity which would interfere with study, we find a still greater difference in grades. Those who are doing nothing on the side are in scholastic averages two and a half points (about .4 of the Standard Deviation of the grade distribution) below their more active fellows. True, they are also nearly .1 of a sigma lower in Mental Test Ratings, so that they are slightly an inferior group to begin with, but the correlations suggest that *lack of application rather than lack of ability* accounts for the contrast in scholastic effectiveness.

When we further consider that the group neither in activities nor in self-support includes a certain number of so-called “grinds,” who raise the average for this group, we have an excellent example of the conflicting factors previously referred to, which tend to reduce observed differences between groups of considerable size. It would appear from this table, then, that extra-curriculum activities, instead of being detrimental to classroom work may actually be favorably related to it. Let us examine this situation further, particularly as investigations previously conducted elsewhere are rather at variance with each other on this point (32, 73, 79, 89, 90, 93, 150).

ANALYSIS OF SPECIFIC ACTIVITIES

In the next table, records are separately presented for students associated to any important degree with each of the respective activities. The net total number thus classified as engaged in athletics is 1,063 and in non-athletic activities, 392. Of the remainder classified as not engaged in activities, 1,387, a substantial number participated sporadically in such activities but failed to win insignia or to continue active competition.

The figures in table XLII (p. 88) show relatively high correlation between Grades and Mental Test Ratings for all of the Activity Groups, with the exception of Hockey. It is probable that the low correlation in the latter instance may be due to peculiar local difficulties connected with its pursuit at the time. Students in both the Athletic and Non-Athletic Activity Groups excel those not engaged in such activities, in average Grades, in Mental Test Ratings, and in correlation between the two. Within the entire Activity Group, however, students engaged in non-athletic activities somewhat excel those in sports.

The high Mental Test Rating of the Non-Athletic Activity Group is striking, and equaled only by the crew squad among the sport participants. The major sports in general, and particularly football, show the highest correlations between Mental Ratings and classroom Grades. As such correlations indicate the relative degree to which students' classroom work is a function of their academic potentialities, this would indicate that participation in sports may even act as an indirect incentive to study. The high scholastic eligibility requirements for participation in athletics at Yale no doubt are influential in this connection. Since students in activities excel those not so engaged both in academic averages and in correlations between Grades and Mental Ratings, this and the succeeding analysis both suggest

rather paradoxically that the Activity Groups also evidence higher than average motivation. Again we may not be certain that this is the true explanation of the observed differences. The correlations may, on the one hand, merely result from less time for study left to the activity participants—though the lack of any apparent relationship between study time and grades throws doubt on this alternative explanation.

It is also possible that the Non-Activity Group may contain certain students sufficiently inferior academically to have been excluded by disqualification from official participation in extra-curriculum affairs, almost from the start of their undergraduate course. Since all recognized participation has sufficed for inclusion in the Activities category, however, this too is a most unlikely reason for the observed differences. While recognizing these contingencies, therefore, we feel reasonably sure that activities, at least under the Yale conditions of eligibility, actually exert a somewhat favorable influence upon academic motivation and resulting achievement. Two important recent studies—Chapin's at Minnesota (148; 151, p. 356) and Ruble's at Indiana (156)—agree in support of this interpretation.

The following table analyzes further the different phases of extra-curriculum effort. Reported Time in Activity averages for the respective groups are included as of possible interest although their reliability is under the circumstances indeterminate. The nature of this analysis in fact gives no assurance that they represent with any accuracy the relative demands made upon students' time throughout the year as a whole, by the different activities here considered.

STIMULUS AFFORDED BY ELIGIBILITY REQUIREMENTS

It will be noted that non-athletic activities seem to take more time on the average than do sports, but that the time spent in study by these two groups is practically identical. Students not in activities evidently spend but little more time in study than do those actively interested in extra-curriculum pursuits. That this is by no means wholly due to self-support effort is clear from the previous table.

At any college which has reasonably rigid eligibility requirements, a certain class of students especially interested in athletics or other activities, through their desire to remain eligible to participate therein, are anxious to do at least well enough in studies to keep off warning and disqualification. Whether such students are desirable is another question—probably some are and some are not; but at least their activities provide some definite scholastic incentive up to a certain level. That level may and often does actually represent a high level of attainment for no small number of them. Where this type of motivation of course fails to act as effectively is with the superior student who is content easily to get his "C plus" average and devote the rest of his energy to other forms of effort. The important question here is whether or not many of these same superior students would devote the extra effort to study if their student activities were curbed. A good many potentially superior students in the Non-Activity Group certainly do not—they simply divert themselves in other and often less profitable ways. Those who are *not* self-supporting and still are *not* in activities do distinctly the most inferior scholastic work of all the groups studied. Nor

can this apparently be explained on the ground that they are proportionately inferior potentially for the correlations particularly suggest that such an explanation does not hold.

TABLE XLII

Analysis of Students in Extra-Curriculum Activities as Compared with Those Not So Engaged

	No. of Cases	Scholastic Average to Date		Average Mental Test Rating	Correlation between Mental Rating and Grades	Number Returning Time Charts	Mean Time Reported Spent in Extra-Curriculum Activities (per Week)	Mean Time Reported Spent in Study (per Week)
Football	175	73.8	$\pm .30$	2.78	.66 ($\pm .03$)	102	8.2	19.7
Baseball	101	73.9	$\pm .42$	2.72	.54 ($\pm .04$)	48	9.3	20.1
Crew	217	76.6	$\pm .26$	3.29	.52 ($\pm .03$)	153	7.4	19.4
Track	221	75.6	$\pm .34$	2.88	.49 ($\pm .03$)	117	9.2	21.0
Hockey	64	76.5	$\pm .61$	2.81	.10 ($\pm .08$)	31	7.8	19.8
Five major sports	547	75.4	$\pm .14$	2.86	.55 ($\pm .02$)	451	8.4	20.0
Minor sports	808	76.3	$\pm .13$	2.94	.42 ($\pm .02$)	402	8.3	20.5
All athletics	1,063	75.9	$\pm .12$	2.90	.48 ($\pm .01$)	853	8.4	20.2
Publication boards	193	76.9	$\pm .28$	3.32	.41 ($\pm .04$)	142	12.5	18.5
Dramatic, debating, musical clubs, etc.	252	77.5	$\pm .26$	3.25	.51 ($\pm .03$)	148	12.0	21.0
All non-athletic activities (net total)	392	77.2	$\pm .19$	3.28	.45 ($\pm .02$)	290	11.5	20.1
All students engaged in extra-curriculum activities (net total)	1,244	76.4	$\pm .12$	3.04	.46 ($\pm .02$)	884	9.9	20.2
All students not engaged in such activities	1,399	74.6	$\pm .12$	2.97	.30 ($\pm .01$)	402		21.2
Entire undergraduate body for whom data are available	2,643	75.4	$\pm .09$	3.00	.41 ($\pm .01$)			

ACTIVITY A GENERAL CHARACTERISTIC?

WE may perhaps be permitted the following speculative explanation, *viz.*, that the active, ambitious student gets into the habit of doing all his jobs pretty effectively. For one thing, he organizes his time and learns to concentrate on whatever task he undertakes, to a greater extent than does his fellow who is more generally shiftless and more interested in simply having what he calls a good time (13, 35, 43). It is this sort of intellectual parasite who is a bane educationally—not the one who is a leader in student activities. The men who took the trouble to coöperate most fully and intelligently in our Student Survey were noticeably those who had most to do in activities—while these men at the same time stood higher than average in their studies. The student after all may be much like the older

executive in this—that once he gets the habit of activity in one direction he carries it with him into other lines (148). Psychologically this is merely a theory of transfer by a conditioning process, of activity primarily stimulated in one direction toward some specific goal and later carried over into other activities for which original and direct motivation had been lacking (7). Whether this theory is scientifically defensible may be open to question. The classical transfer of training experiments, however, do not, we feel, offer any pertinent or conclusive refutation thereof, because we are here dealing with a transfer not of narrow skills but rather of high-level attitudes, built up probably by an elaborate conditioned process. Evidence both for and against this view may be found in the literature. Chapin's (148) findings particularly support the conclusions reached herein. Probably the lack of agreement is in large measure due to the great variation in other factors of influence at different institutions (25, 78, 89, 90, 93). Appendix D-6, p. 171, contains additional data regarding students' evaluation of these activities.

THE VALUE OF CLEARLY CONCEIVED PURPOSE

PRESIDENT HADLEY once commented on how much easier teaching would be if we could only elevate study to the level of extra-curriculum activity. This characteristic epigram strikes profoundly at what the writer feels is the root of our present-day teaching problem. Just that is what our course of study needs. In an age which colleges have taught to be curious and skeptical, reasons for studying are no longer to be taken on faith. We encourage students to ask the why and wherefore of events; we teach them to be guided by logical inferences from observed phenomena; we caution them to beware of experimental errors and of conclusions based on hearsay—and then we berate them for needing to be shown *why* after all they should take a more lively interest in Classical Civilization or the Mind-Body problem than in the ability to kick a field goal from the forty-yard line. As Richardson has said (7, p. 59), the coach is unique in having “a class painfully intent on getting what he has to offer; not sixty per cent of it, but all of it.”

We are not attempting here to uphold the present overemphasis on such activities, but simply to point out that a student's incentive in such directions is readily aroused because there he can *see his objectives*; where he is going in the classroom, or what the whole curricular picture means, too frequently is but “seen through a glass darkly.” In fact we must recognize the influence of such specific motivation factors upon American college students whether we like it or not. Of more fundamental importance to education no doubt are the higher forms of motivation which we wish to inculcate in students, and whose relation to other factors we have already considered. Perhaps that is why preparedness for success in life is apparently no more surely predictable from grades or test ratings alone than it is related solely to the individual's degree of participation in activities (80, 94, 193).

If these arguments are valid, they offer a striking commentary on the modern American college. Certainly it is an anomalous situation, wherein we find that the secondary and in a sense negative motivation of student activities may afford as much of a spur to many potentially able students as does any *positive* urge offered by the curriculum itself.

Students supposedly go to college for instruction, yet in order to make them get it, must we really rely on their desire to edit papers or play on teams? It might almost seem as if the much abused extra-curriculum activity were one of the few stimuli to academic effort still extant! While such a statement no doubt exaggerates an argument perhaps already overemphasized, prominent students of outstanding ability and real intellectual power, lately questioned about these conclusions, have emphatically endorsed them, though voicing equally strong opposition to the conditions they reveal. No inconsiderable amount of opinion, in fact, tends to support these contentions and to indicate that they are justified. Purpose, for the student, is apparently so lacking in our present-day curriculum that the course of study in itself offers largely insufficient positive incentives to many of our potentially ablest and most worth-while undergraduates.

This would seem to justify a warning not lightly to legislate against such sources of motivation as we have, however we may regard them educationally—at least until we have successfully substituted better ones. What goal, indeed, are we making sufficiently clear and magnetic to our college student for him to be driven by a higher form of urge than those we have just discussed? Student activities have evolved as an outlet for the energy and ambition of those to whom the present purposeless, disoriented course of study frequently offers, of itself, an entirely inadequate appeal. To curb the activities without correcting the evil from which they sprang—curricular sterility—might but drive undergraduates to find other and less desirable means of diversion.

INFLUENCE OF PURPOSE UPHELD

IF we now seek a basic explanation for the stimulative effect, all along the line, of the factors whose influence we have studied, its most logical expression seems to be in terms of *purpose*. This may be direct, as in the case of highly oriented students, or indirect as with those motivated by secondary factors such as financial aid or other extra-scholastic interests. In other words undergraduates study if they see good reason for doing so. The investigation of extra-curriculum activities made in the present chapter tends to support the conclusions previously reached from the analysis of grades alone. In fact the importance of *purposive motivation*, which we believe is the common basic stimulus to all the various factors studied, has been further emphasized by our examination of extra-curriculum pursuits.

We now have to consider a totally different part of this investigation, dealing not with the analysis and the records of *different* groups of students, but with a study of the replies of *all* students to questions regarding the value of courses. The importance of purpose as a motivating factor in scholastic work has appeared consistently throughout the preceding investigations. We shall attempt in the next chapter to secure still further information regarding its relation to academic achievement.

SUMMARY

WE have attempted first to demonstrate that the influence of student activities and of self-support must be recognized in personnel studies and that failure to do so may prove an

important source of error; and second that undergraduates participating in such activities are distinctly better students and measure up to their scholastic potentialities to a higher degree than do those who are not engaged in any form of outside effort.

This, we suggest, is largely because in our present educational situation higher and more ideal forms of motivation are lacking—and in their absence the secondary types of incentive are probably better than none. Until positive academic inspiration is developed, we should therefore not deal too harshly with the indirect stimuli now at least somewhat effective.

The influence of purposive motivation has appeared thus far of sufficient scholastic importance to warrant our investigating it by other means. The undergraduate body as a whole, however, must be relatively little affected by it, in order for such influences as discussed herein to prove so effective. Therefore we shall now inquire further into the academic situation which affords such indirect factors as those previously studied an opportunity to exert the very appreciable effects upon scholastic achievement, which we have herein noted.

X.

REQUIREMENTS AND ELECTIVES

THE question of elective versus required courses has for many years been a subject of educational controversy. On the one hand are certain arguments against allowing complete freedom of choice to a student, lest he choose unwisely; on the other the homely adage that you can lead a horse to water but you cannot make him drink. Granted that mature judgment is required to plan a course of study, it may still be argued that an unsound course enthusiastically pursued may be of greater intellectual benefit to the individual than will half-hearted application to a curriculum, however sound, in which the student is not interested. Educational policies of today no longer demand the former strict compliance with a rigidly prescribed course of study. It is now felt that the varying interests of different individuals should be respected so far as possible and that not every mind will react with equal success to exactly the same subjects (8, 138).

Yet there is a strong belief in the sacredness of certain subjects as educational processes. Most teachers, to be sure, feel that their particular subject is the one which, above all others, has a necessary part in the cultural equipment of any "educated" person. Since it is manifestly impossible for every student to acquaint himself with every such subject, certain studies have won out in these educational debates, and have obtained the dignity of "requirements" while certain others have been consigned to the "elective" category (7). If education is primarily a process of mental development, perhaps the indispensability to all students of any particular subject may be challenged. While such a study as this is no place for speculation on controversial topics, we may perhaps be permitted to venture sufficiently from the realm of fact into that of opinion, first to comment on a condition which seems to have developed from these pedagogical arguments, and then to present certain data which may have a bearing thereon.

THE DISTRIBUTION REQUIREMENT

THE principle that certain subjects are essential to any educated person's equipment has led to the doctrine of distribution. At most colleges enough diversification is required to insure the student's exposure to each of several fields of study, while at the same time, a measure of concentration in a single field is also usually demanded in the latter half of his course. Although considerable variation in the application of these principles exists at different institutions (7), enough general uniformity is found to warrant confidence in their basic soundness, which seems to represent a common-sense point of view. Like many other sound doctrines, however, this can be carried to excess.

The conflict between prescribed and elective parts of curricula has enormously increased the multiplicity of courses and proportionately enhanced the difficulty of any individual's dovetailing the subjects he may want into the various requirements of diversification.

Finally we have in many universities arrived at a situation where purely mechanical considerations, such as the avoidance of conflicts and the convenience of schedules, actually play no small part in determining the course of study chosen. These complications may prove particularly troublesome to a student with sufficient intellectual curiosity or initiative to depart from the usual run of choices. (*Cf.* Appendix D, p. 163.)

In the confusion of requirements, continuation courses, majors, and electives the student frequently loses any real sense of direction and ends by piling up a series of properly distributed credits which duly entitled him, as complying with the catalogue requirements, to a degree; but which are so disconnected as by no means to assure his having received an education in the true sense of the term (96). In other words the divided allegiance to distribution and to concentration, to the prescribed and the elective systems, has for many students reduced the selection of a coördinated course of study from a rational act to a process of checks and balances. Educational purpose has been supplanted by the mechanism of schedule-fitting and the casting up of credits on an adding machine has become the route to a diploma (3).

Part of the Student Survey aimed to secure objective data with reference to the effect of present-day requirements upon the student's own work and outlook.

STUDENT CRITICISM OF THE COURSE OF STUDY

THIS analysis first concerns itself with different broad departments of study and next, irrespective of particular subjects, with the relation of required and elective courses, respectively, to students' opinions regarding their relative value. Certain other material not sufficiently a part of our present problem to be reproduced here, but possibly of interest in this general connection, will be found on pages 162-163 of the Appendix (Section D).

Student criticism of the curriculum was analyzed from replies to a series of inquiries concerning required and elected subjects of study, the time and effort expended on courses, satisfaction derived therefrom, quality of respective academic achievement, etc. (*cf.* Appendix, Section B). Alternate questions in this battery were in a sense mutually opposed. For convenience of reference, and in order to illustrate this inverse relationship between succeeding queries, the crucial points with which they dealt are set forth below in two columns, one representing all odd numbers in the series and the other all even numbers.

- | | |
|--|--|
| 1. Major field of study elected. | 2. Undesired courses taken only to satisfy requirements. |
| 3. Course to which most time was devoted. | 4. Course to which least time was devoted. |
| 5. Course on which most intellectual effort was expended. | 6. Course on which least intellectual effort was expended. |
| 7. Course in which work most satisfactory to the student was done. | 8. Course in which work least satisfactory was done. |
| 9. Course regarded as of greatest value to the student. | 10. Course regarded as of least value to the student. |
| 11. Course in which best grades were obtained. | 12. Course in which worst grades were obtained. |

Judging by the care and completeness with which it was answered, this inquiry seems to have been of particular interest to students. Since their own views are what we are here interested in, the subjective nature of students' replies does not invalidate the investigation. Elimination of all cases which did not offer a complete set of replies to all twelve of these queries was necessary (for statistical reasons) so that some replies, either incomplete or in part not sufficiently definite, were rejected. Even after these deductions, a total of 1,442 usable answers remained, upon which the analyses below are based.

METHOD OF ANALYSIS

THE problem presented peculiar complications on the side of statistical treatment. It was of course easy to tabulate the mere *count* of opinions as to various subjects and courses, as expressed by the different groups (Yale College, Sheffield Scientific School, and Freshman Year students). This yielded interesting data, as shown in the charts following, in regard to student opinion about different subject groups as a whole, and the interrelation of such replies to those questions which were mutually complementary. This, however, gave only part of the picture and it was found necessary to undertake more detailed interpretations of the data. The method devised for this purpose, an *analysis of correspondences*, is in the nature of a graphic representation of correlation between dichotomous units, and will be fully described later. First, however, we shall present simply the tabulation of replies to the different questions, converted in each case, in the interest of clarity, to a percentage basis.

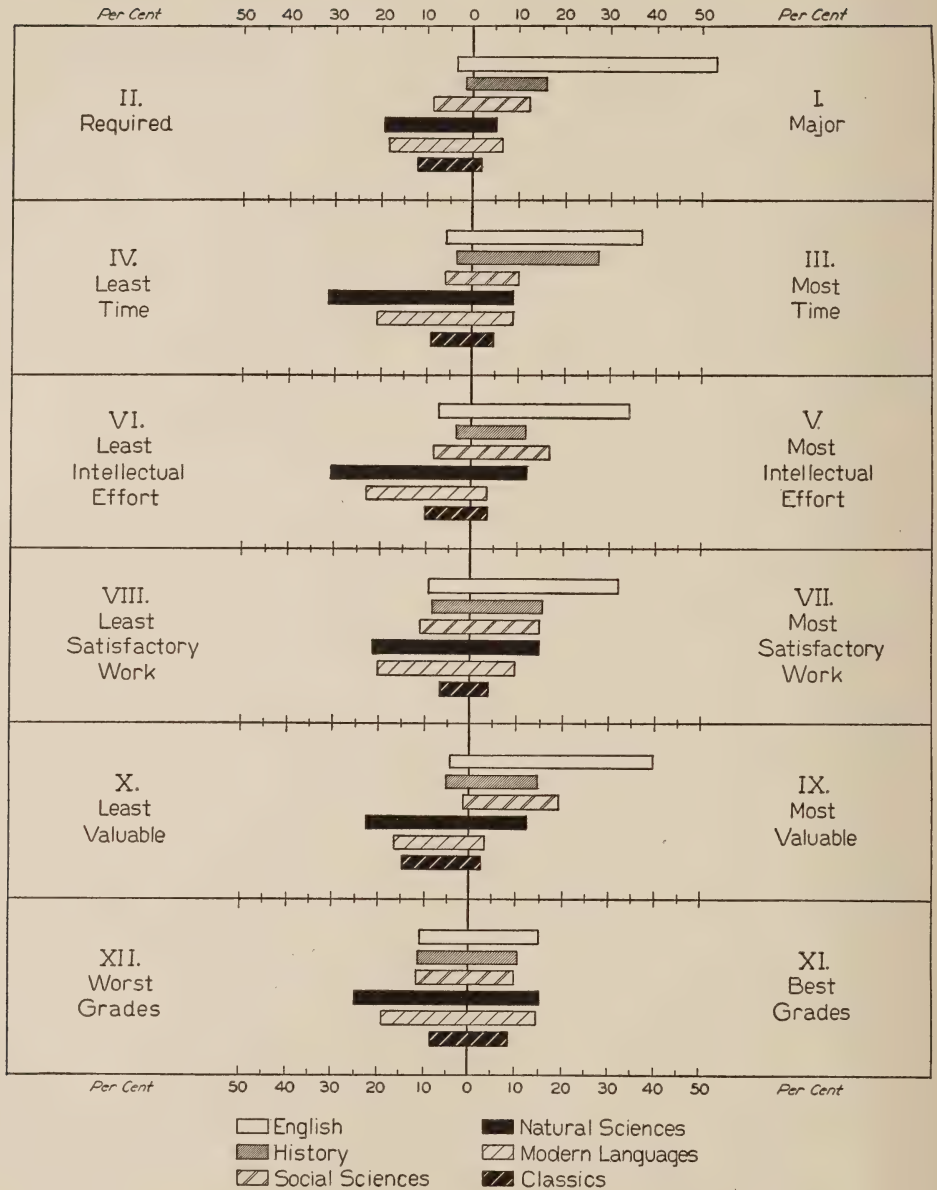
In the charts which follow, the odd-numbered (favorable) replies all appear on the *right* side of the mid-line, and the even numbered (unfavorable) replies on the *left* of this same line. Mutually opposing questions are opposite each other on the chart; mutually complementary ones are ranged vertically.

The opinions of both College sub-groups (B.A. and Ph.B. candidates) and both Scientific School sub-groups (Engineering and Non-Engineering students) were originally analyzed but the differences between them were insufficient to warrant complicating still further the presentation of this analysis, by reporting the results for each of these four sub-groups individually considered. Therefore tabulations given below are for the entire College and Sheffield groups, respectively. The Freshman Year replies were separately considered for reasons subsequently stated.

As might be expected, the academic and scientific departments differ markedly from each other in opinions as to the value of different subjects of study. English, for instance, receives the largest proportion of favorable replies from the College group, with most criticism directed against the Natural Sciences and Modern Languages. History and the Social Sciences are on the whole favorably regarded and Classics, rather unexpectedly perhaps, unfavorably so. It is interesting to note that the grades received in different subjects do not tally with students' opinions as to the effort expended thereon or their relative value. In fact there is quite a uniform division between "best grades" and "worst grades" for most of the subjects, so that it is fair to assume that marks have by no means been the students' sole criterion as to value of the different courses.

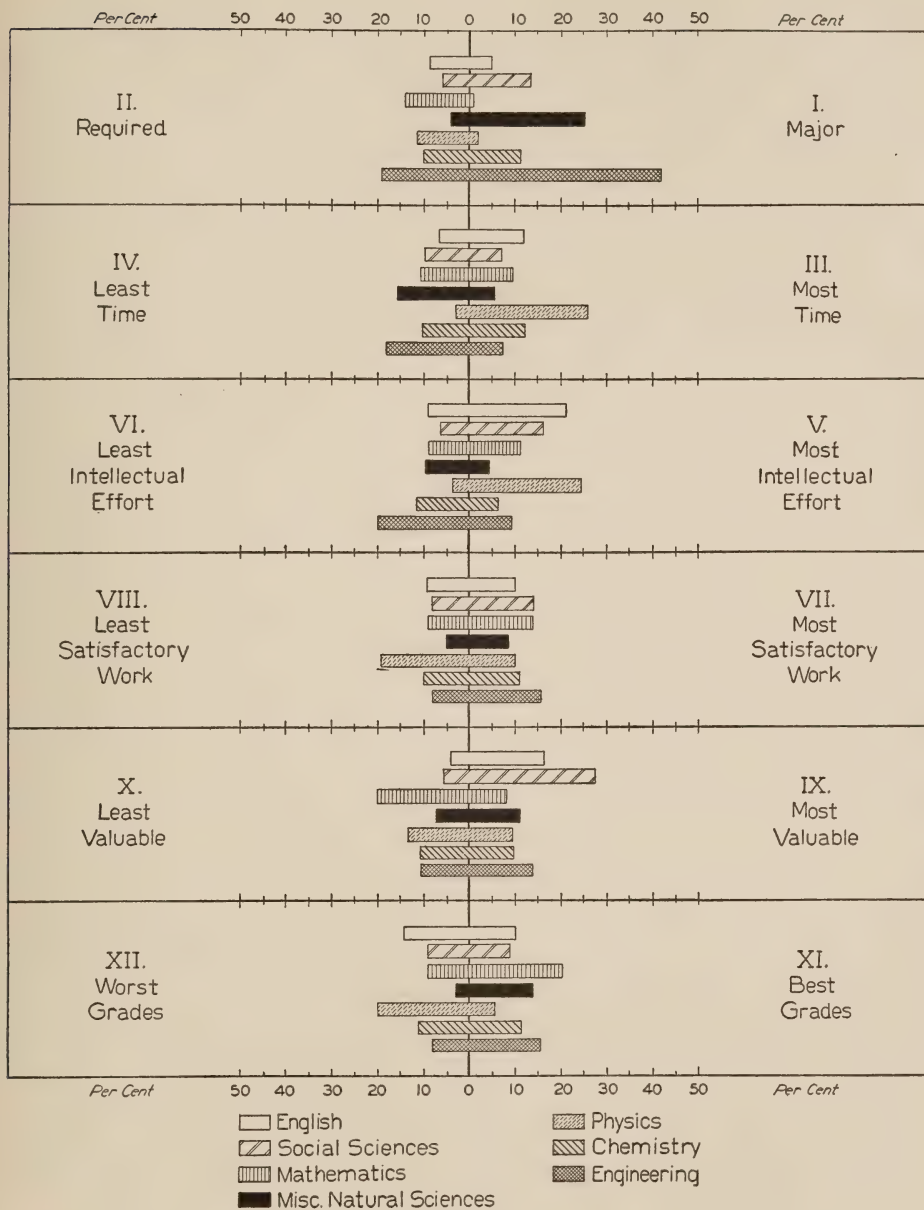
YALE COLLEGE. GRAPH OF TALLY

762 Cases



SHEFFIELD SCIENTIFIC SCHOOL. GRAPH OF TALLY

309 Cases



Perhaps the most striking evidence from these charts, however, is the agreement between complementary questions, not only with each other, but with the elective or required status of the course. That is, the subjects which most students wanted to take, they spent most time and effort on and derived the greatest satisfaction and value from, while the least value and satisfaction, the least time and intellectual effort, are found closely associated with those courses which students were unwillingly *required* to take.

REACTIONS OF THE SCIENTIFIC STUDENTS

CONSIDERATION of the Sheffield replies presents a somewhat different picture. Here there is not the same degree of correspondence between complementary questions. The favorite elected subject groups in several instances subsequently appear on the unfavorable side of the chart; while English, which most of the Scientific students apparently took because they had to, appears to have elicited a high degree of intellectual effort and to have been considered as one of the courses of greatest value. Again with Sheffield students, there is evidence of other criteria as to value and satisfaction derived from courses, than that of the grades received therein. The chart of Physics is interesting. To many students this subject is apparently an unwelcome requirement; it is evidently a course of outstanding difficulty, judging from grades; it requires the most time and effort, yet opinion as to its value is about evenly divided.

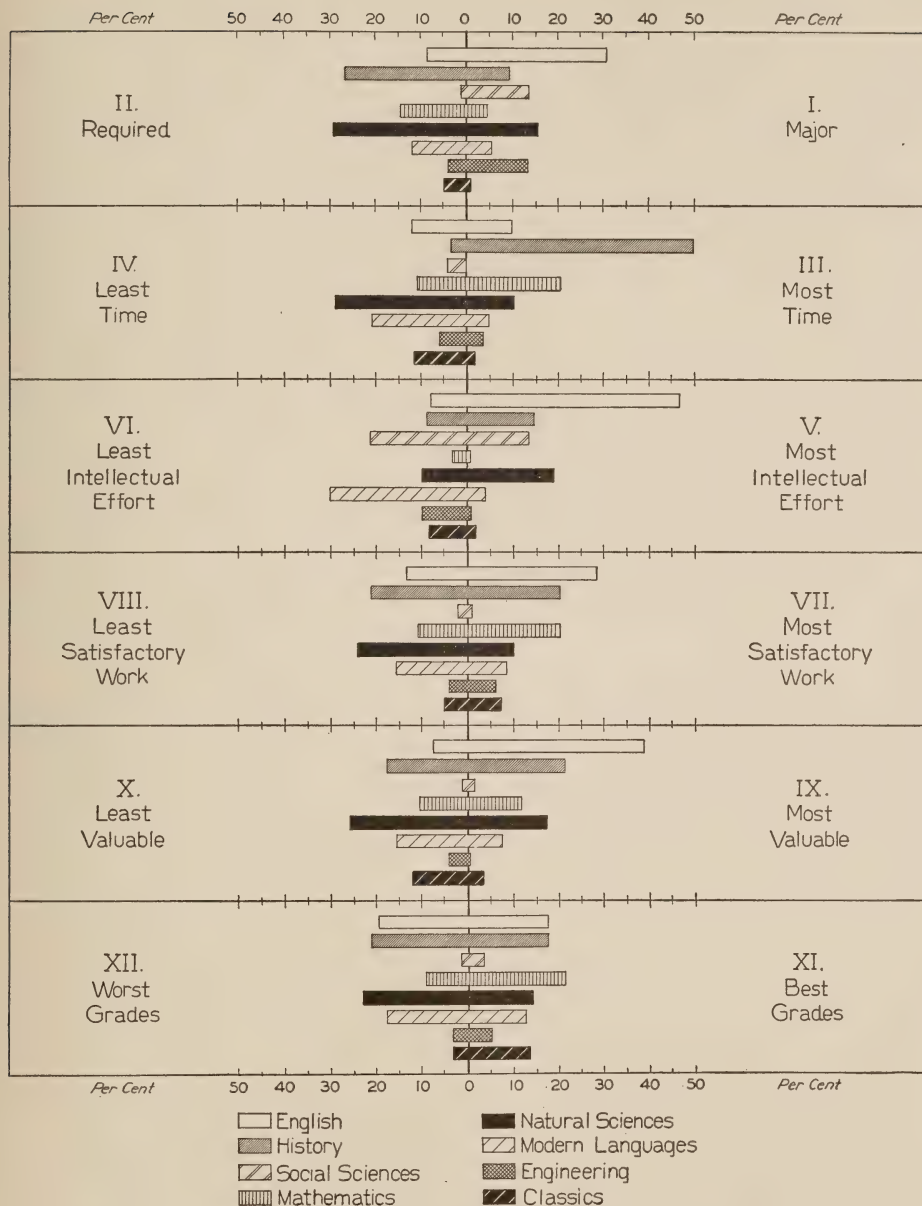
These two charts illustrate an important factor which should be kept in mind with respect to the logical difference between a liberal college curriculum and that of a scientific and engineering school. The point of view and educational purpose of these schools are themselves admittedly different. The one aims at a general cultural course of study; the other at a more specific type of training. The purpose of neither, to be sure, should be entirely foreign to the other; yet they are undeniably aiming at rather different ends. The engineering student has a more definitely vocational purpose; the college student's aim is more general, less specialized. The different reactions of these two student groups, with widely variant educational interests, are accordingly just what might be expected (6, p. 434).

FRESHMAN REPLIES

WHEN we consider the replies from members of the first year class, we must bear in mind two characteristics of the Freshman situation. First, this class is composed of both College and Scientific elements, as Freshmen do not elect their upperclass school until after their first year is completed. The Class of 1929 divided in the ratio of approximately two-thirds to the College and one-third to the Sheffield Scientific School. In so far as these students had already, by April, to some extent acquired the different points of view characterizing the two upper schools, the Freshman class as a whole represents a combination of these viewpoints, with that of the academic students preponderating in a ratio of about two to one. The pre-College and pre-Sheffield groups in the Freshman class were not separately

FRESHMAN CLASS (1929). GRAPH OF TALLY

371 Cases



analyzed because their election of an upperclass school had not been made at the time of the Survey and the anonymity of replies precluded such procedure at a later date.

Second, the Freshman Year curriculum at Yale is rather rigidly prescribed. All Freshmen must take English and History. Most include among their three other courses a Science and a Language. Hence their range of electives is less than it is for either the College or Sheffield students, and neither the election of a major field of study nor choice of an upper school has yet been indicated. Although, of course, the student may have such a choice definitely in mind, consideration of his future intent has affected only partially, if at all, his actual Freshman Year course of study.

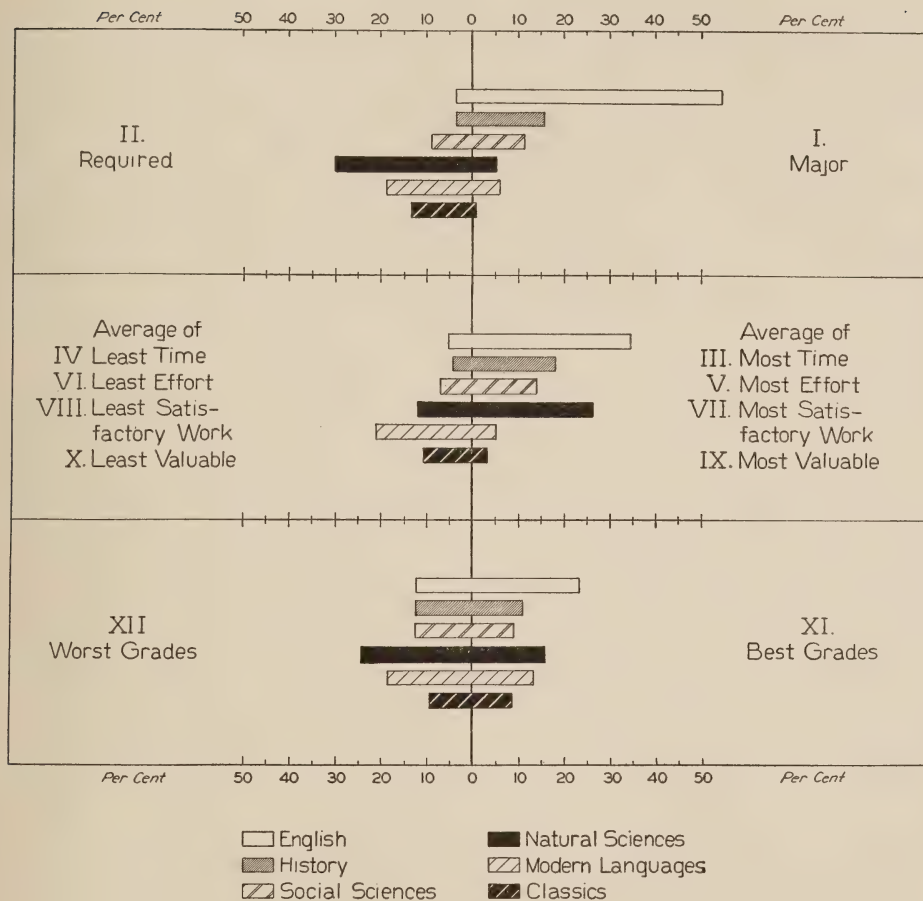
We find the Natural Sciences and History the outstanding undesired requirements, but while the Sciences continue to receive unfavorable comment, History obtains a more favorable reaction—and this despite its being a difficult subject and the one evidently requiring the most time in preparation. The predominance of English on the favorable side of the chart, as the subject requiring most intellectual effort and yielding the most value and satisfaction to the individual, may be due to the greater number of students expecting later to elect work in that field, in Yale College. Mathematics comes off somewhat better than do the Sciences. Both Modern Languages and Classics fare rather ill in these comparisons, and this despite the relatively high grades and low effort reported for the Classics.

The general trend of the Freshman replies conforms, as might be expected, rather to the College graph than to that for the Scientific School. The tendency for required courses to receive unfavorable comment is, however, less pronounced. This may be accounted for by the fact that the initial questions in this series, as to elected versus required courses, have less significance for the Freshman because, as already explained, all Freshman choices are so limited.

The graphs on the three following pages summarize the data just presented. Here are given separately the replies of each group (College, Sheffield Scientific School, and Freshman Year) to the first two (elective versus required courses) and last two questions (subjects yielding best and worst grades). For the eight intermediate questions, an average has been taken for the four favorable complementary comments and for the four corresponding unfavorable ones.

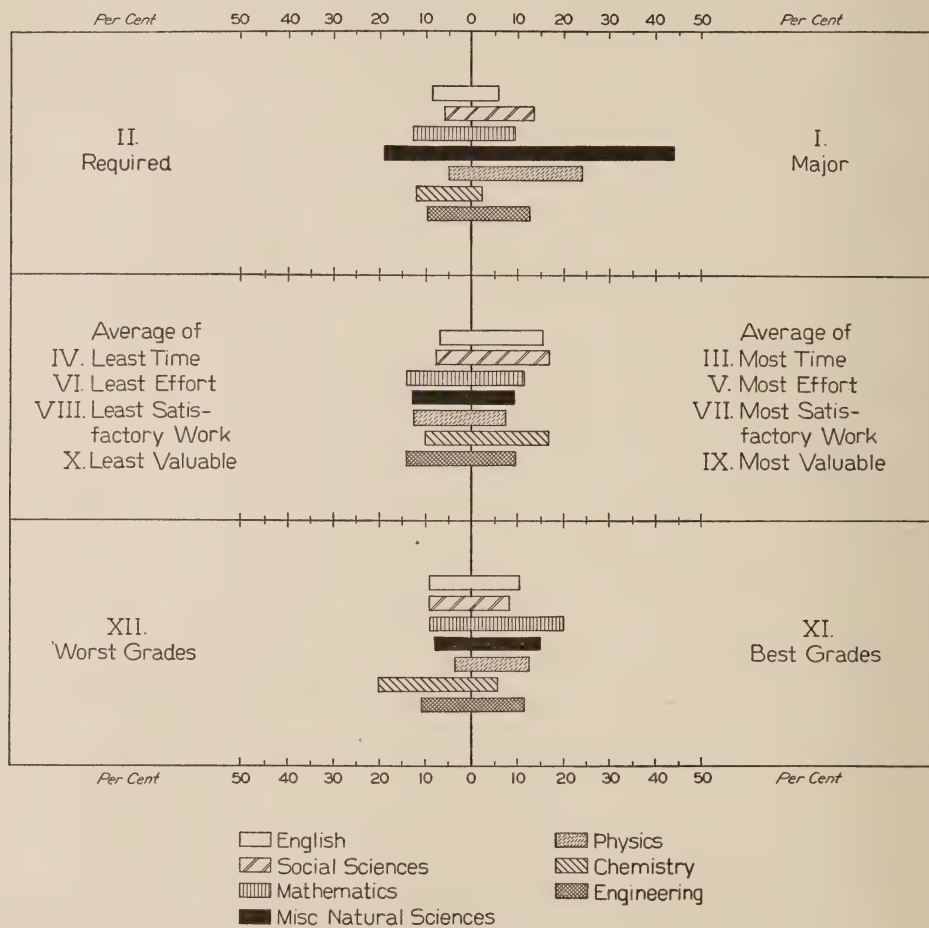
YALE COLLEGE. COMPOSITE GRAPH OF TALLY

762 Cases



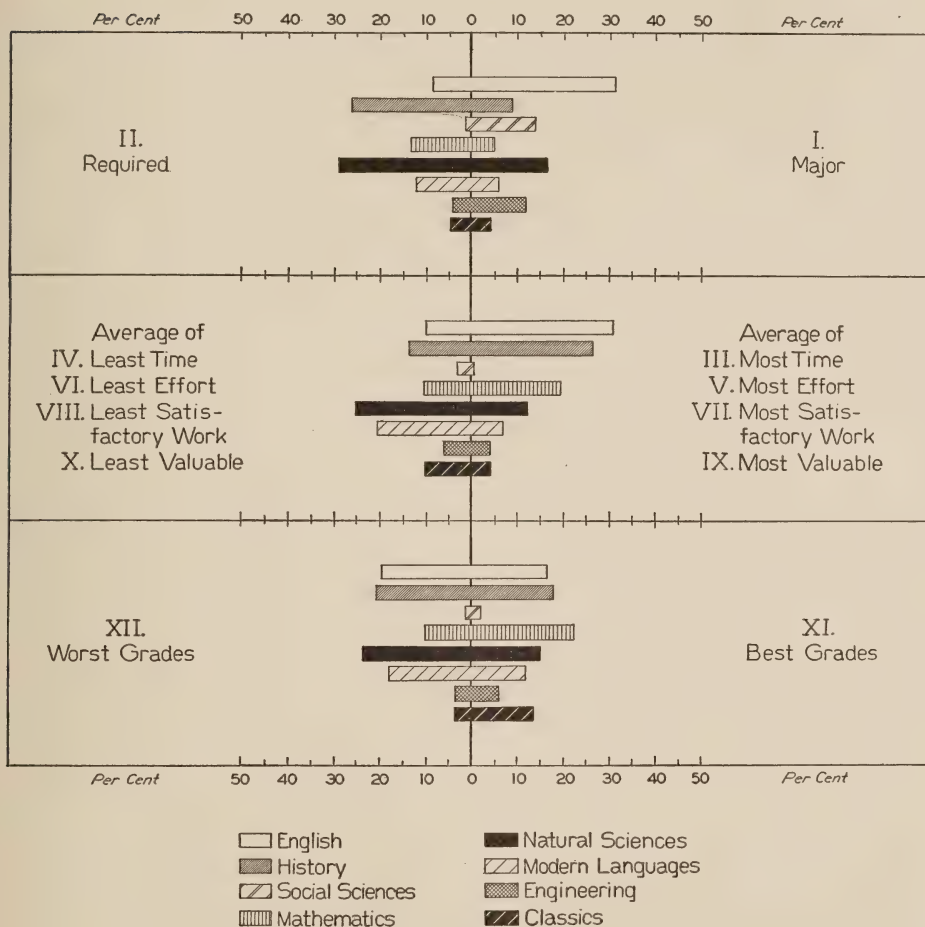
SHEFFIELD SCIENTIFIC SCHOOL. COMPOSITE GRAPH OF TALLY

309 Cases



FRESHMAN CLASS (1929). COMPOSITE GRAPH OF TALLY

371 Cases



We have now to consider the relationship, if any, which can be found to exist, irrespective of the subjects involved, between each of twelve questions asked students about courses with each other one. In particular we wish to investigate the possible effect of elected or required courses upon the opinions expressed about them.

THE METHOD OF CORRESPONDENCE

It is evident that we cannot here utilize any of the usual methods of measuring correlation, since we are dealing with discrete units which are not parts of a series. We cannot very well range our subjects of study in any sort of a scale, or measure quantitatively opinions expressed regarding them on another scale. Nor has it been possible to use Pearson's Coefficient of Mean Square Contingency (104, 105) to measure the correlation between the factors here studied.

What we are attempting to analyze is the *degree of correspondence* found to exist between the different questions. That is, in each set of replies to the twelve questions, we shall see how many questions receive the same answer. If twelve different studies are named in the twelve answers of a given student, then obviously no particular relationship of one question to another exists for that student. If the same study is mentioned by another student in answer to each question, such an apparent relationship would also be meaningless, since the replies to certain questions are mutually exclusive of each other. If on the other hand still another student mentions some particular study several times in the positive questions and stresses some other subjects similarly in answer to the negative ones, then a definite relationship may be said to exist for him between these different questions.

The degree of correspondence thus determined from each individual Questionnaire may be noted and the results for the whole groups of students calculated by analysis of the *percentage of total correspondence*. This was the method used in studying the relationship between questions. Each of the twelve questions served in its turn as the *criterion* or reference question. The total number of replies to each question was first noted; then a count was made of the total number of times each *other* question received the same reply as the *criterion* question had. Naturally the correspondence might occur in any one of many subjects, for this part of the study dealt not with the votes received by particular courses but solely with the recurrence of any one course in answer to more than one question.

Thus a course may be reported in reply to Question III as requiring most time. If the same course is reported in answer to Question V as requiring most intellectual effort, there is a *correspondence* between the replies to III and V regardless of which particular course was named. For instance, in the College group, 970 replies were received to the first question. Whatever subject had been mentioned in reply to the first question was also named by forty students in reply to the second and by 357 in reply to the third. The actual tabulation of correspondences noted between the first two and the succeeding questions is here given for purposes of illustration. Obviously the correspondence noted between one and two is the same (forty cases) as that between two and one.

TABULATION OF CORRESPONDENCES NOTED, FOR YALE COLLEGE STUDENTS, IN REPLIES TO
QUESTIONS ONE AND TWO, WITH SUCCEEDING QUESTIONS

Question I. Major field of study elected.

Question II. Undesired courses taken only to satisfy requirements.

	<i>Ques. I</i>	<i>Ques. II</i>	<i>Ques. III</i>	<i>Ques. IV</i>	<i>Ques. V</i>	<i>Ques. VI</i>	<i>Ques. VII</i>	<i>Ques. VIII</i>	<i>Ques. IX</i>	<i>Ques. X</i>	<i>Ques. XI</i>	<i>Ques. XII</i>
Ques. I	970	40	357	63	316	67	369	70	388	28	463	112
Ques. II	40	1,131	89	210	61	290	36	339	33	427	128	390

It is evident from the tabulation of correspondences that certain significant relationships existed between the various questions. A mere count of the correspondences, however, in the form just presented, would not illustrate these relationships at all clearly. It was therefore deemed advisable to determine from the number of replies to each question what the maximum possible correspondence might be and from this to calculate what percentage of such potentially perfect correspondence actually existed between each question and each other one. The method may be illustrated further from the answers of the Yale College students to Question I, as related to other answers.

In the Yale College group there were 762 individuals who reported one or more courses in reply to all twelve questions. In answer to Question I, which is now to be taken as the criterion or basis for correspondence, a total (including duplicates) of 970 courses were listed by these 762 men as part of the elected major field of study. For replies to another question to correspond perfectly with the replies to Question I, these 970 courses would all have to be repeated in answer to the other question, the same individual always reporting exactly the same course or courses in both replies. This correspondence, however, is never perfect, and the degree of correspondence may be expressed in terms of the extent to which the courses given in Question I are repeated in later questions. The table will make clear the relationship involved.

YALE COLLEGE—762 STUDENT REPLIES

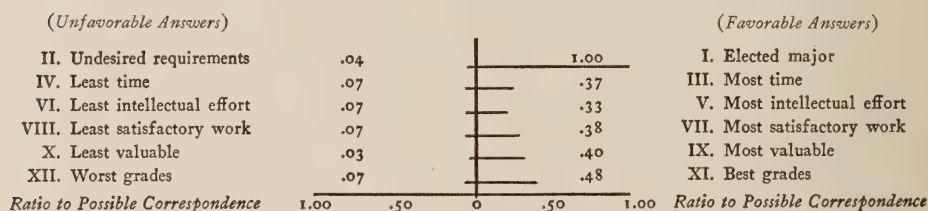
<i>Question Number</i>	<i>Courses, in Answer to the Various Questions, Coinciding with the Answers to Question I</i>	<i>Ratio of Corresponding Answers to Possible Correspondence (970)</i>
I. Elected major	970	1.00
II. Undesired requirement	40	.04
III. Most time spent	357	.37
IV. Least time spent	63	.07
V. Most intellectual effort	316	.33
VI. Least intellectual effort	67	.07
VII. Work most satisfactory to student	369	.38
VIII. Work least satisfactory to student	70	.07
IX. Most value to the student	388	.40
X. Least value to the student	28	.03
XI. Best grades	463	.48
XII. Worst grades	72	.07

For example, in answer to Question XI, 463 of the 970 courses listed in answer to Question I were here repeated. That is, of 970 courses reported as part of the elected major field, 463 were also courses in which the best grades were made. This degree of correspondence may be expressed for convenience as a ratio of 463/970 or .48, as recorded in the right-hand column of the table.

If these correspondence ratios for the odd-numbered questions are now represented graphically to the right of a reference line and the ratios for the even-numbered ones are measured to the left, the following chart results. The numerical values used as the basis for plotting are those of the preceding table.

YALE COLLEGE—762 STUDENT REPLIES

Percentage of replies to subsequent questions, which repeat replies received to Question I, regarding courses elected as part of major field. (Above totals here expressed as a ratio to 970, the possible perfect correspondence)



This graphical method has been chosen because it seems most clearly to portray the relationship between answers. The line of length 1.00, in the chart above, represents the correspondence of the answers to Question I with themselves, perfect of course, but included as a unit of a reference. The other lines express relative correspondence of other questions with Question I.

The chart shows a rather striking correspondence with the odd-numbered, favorable to scholastic effort and achievement, while there is very slight correspondence with the even questions, unfavorable for the most part to sound scholarship. While the results appear to be reasonable, they could not with certainty have been predicted.

Before making any deductions, the rest of the data must be presented. The method followed in determining the degree of correspondence is in every case that which has just been illustrated. The "negative" questions, as in the previous discussion, are arranged over each other on the left of the zero line, with the positive questions on the right of this vertical. Mutually opposed questions stand directly opposite each other. In each case the *criterion* question itself serves as a reference scale since it corresponds perfectly with itself and is therefore represented by a crossbar extending the full length of the percentage scale.

As it was necessary before beginning this study arbitrarily to group courses in the same subjects, even mutually exclusive questions yield a small degree of paradoxical corre-

STUDENT REPORTS CONCERNING COURSES - ALL COLLEGE STUDENTS

STUDENT REPORTS CONCERNING COURSES - ALL COLLEGE STUDENTS

I MAJOR - (LINED COURSE) : Corresponding with other items

II REQUIRED - (DISLINED COURSE) : Corresponding with other items

II REQUIRED - DISLINED

III LEAST TIME

IV LEAST INTELLECTUAL EFFORT

V LEAST SATISFACTORY WORK

VI LEAST VALUABLE

VII WORST GRADES

I MAJOR - LINED

III MOST TIME

IV MOST INTELLECTUAL EFFORT

V MOST SATISFACTORY WORK

VI MOST VALUABLE

VII BEST GRADES

III MOST TIME - (COURSE REQUIRING) : Corresponding with other items

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II MOST INTELLECTUAL EFFORT - (COURSE REQUIRING) Corresponding with other items

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VII MOST SATISFACTORY WORK - (COURSE IN WHICH WAS DONE) : Corresponding with other items

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III MOST VALUABLE - (COURSE) Corresponding with other items

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VI BEST GRADES - (COURSE IN WHICH WERE OBTAINED) : Corresponding with other items

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II BEST GRADES

III LEAST TIME - (COURSE REQUIRING) : Corresponding with other items

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VII LEAST INTELLECTUAL EFFORT - (COURSE REQUIRING) : Corresponding with other items

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VIII LEAST SATISFACTORY WORK - (COURSE IN WHICH WAS DONE) : Corresponding with other items

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XII

IX LEAST VALUABLE - (COURSE) : Corresponding with other items

I

II

III

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VI

VII

VIII

IX

X

XI

XII

XII WORST GRADES - (COURSE IN WHICH WERE OBTAINED) : Corresponding with other items

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III

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V

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VII

VIII

IX

X

XI

XII

IX WORST GRADES

STUDENT REPORTS CONCERNING COURSES ~ ALL SHEFFIELD STUDENTS

STUDENT REPORTS CONCERNING COURSES ~ ALL SHEFFIELD STUDENTS

I MAJOR-(LIKED COURSE): Corresponding with other items

II REQUIRED-DISLIKED

III LEAST TIME

IV LEAST INTELLECTUAL EFFORT

V LEAST SATISFACTORY WORK

VI LEAST VALUABLE

VII WORST GRADES

I MAJOR-LIKED

II MOST TIME

III MOST INTELLECTUAL EFFORT

IV MOST SATISFACTORY WORK

V MOST VALUABLE

VI BEST GRADES

II REQUIRED-DISLIKED

III LEAST TIME

IV LEAST INTELLECTUAL EFFORT

V LEAST SATISFACTORY WORK

VI LEAST VALUABLE

VII WORST GRADES

I MAJOR-LIKED

II MOST TIME

III MOST INTELLECTUAL EFFORT

IV MOST SATISFACTORY WORK

V MOST VALUABLE

VI BEST GRADES

III MOST TIME-(COURSE REQUIRED): Corresponding with other items

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VI MOST INTELLECTUAL EFFORT-(COURSE REQUIRED): Corresponding with other items

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VII MOST SATISFACTORY WORK-(COURSE IN WHICH WAS DONE): Corresponding with other items

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III MOST VALUABLE-(COURSE): Corresponding with other items

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VI BEST GRADES-(COURSE IN WHICH WERE OBTAINED): Corresponding with other items

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III LEAST INTELLECTUAL EFFORT-(COURSE REQUIRED): Corresponding with other items

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VIII LEAST SATISFACTORY WORK-(COURSE IN WHICH WAS DONE): Corresponding with other items

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IX LEAST VALUABLE-(COURSE): Corresponding with other items

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XIII WORST GRADES-(COURSE IN WHICH WERE OBTAINED): Corresponding with other items

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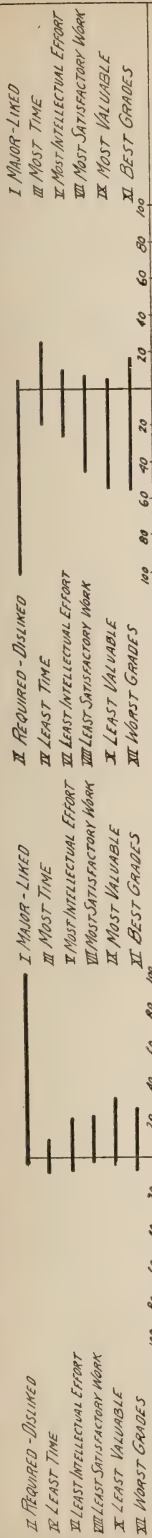
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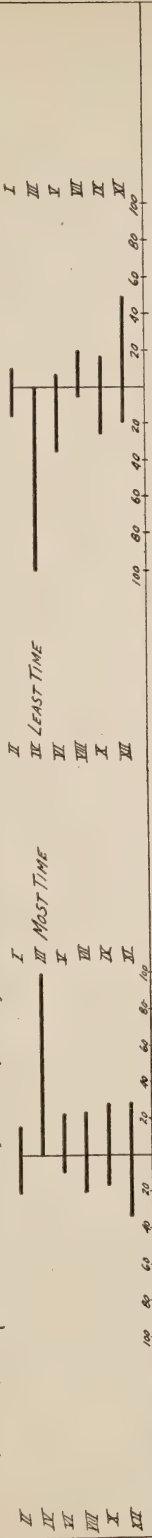
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II REQUIRED - (DISLINED COURSE): Corresponding with other items



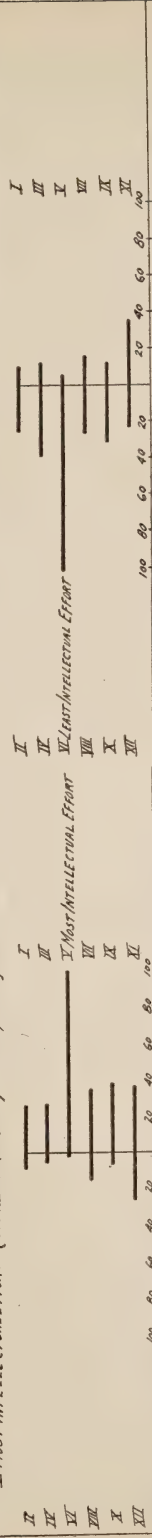
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IV LEAST TIME - (COURSE REQUIRING): Corresponding with other items



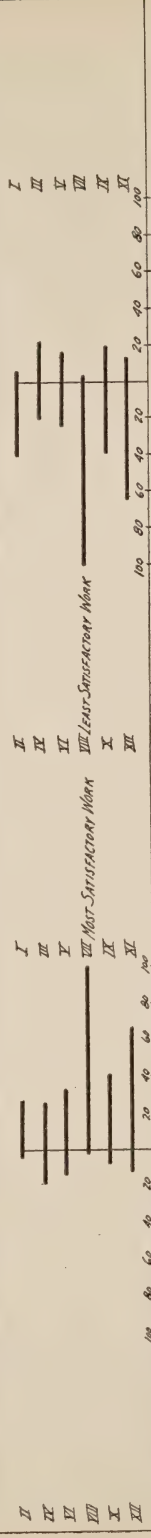
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VI LEAST INTELLECTUAL EFFORT - (COURSE REQUIRING): Corresponding with other items



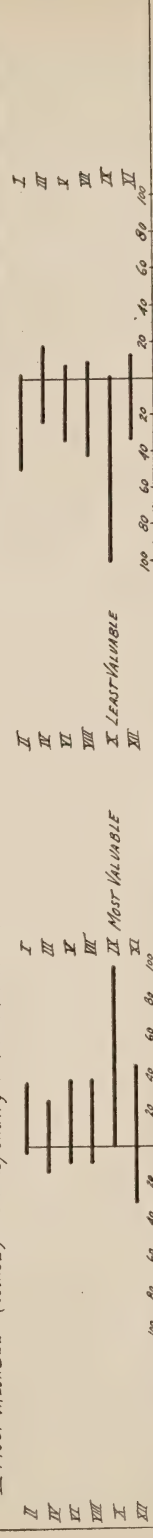
VII MOST SATISFACTORY WORK - (COURSE IN WHICH WAS DONE): Corresponding with other items

VIII LEAST SATISFACTORY WORK - (COURSE IN WHICH WAS DONE): Corresponding with other items



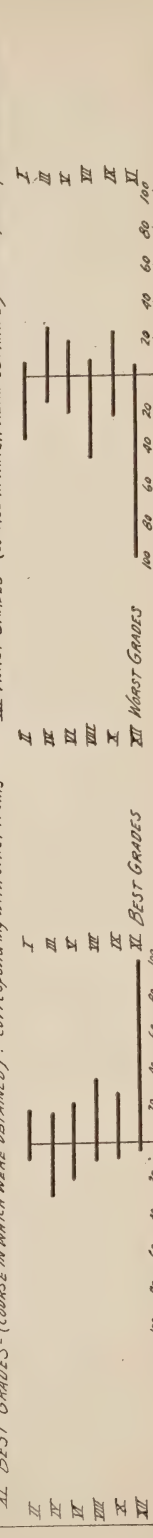
IX MOST VALUABLE - (COURSE): Corresponding with other items

X LEAST VALUABLE - (COURSE): Corresponding with other items



XI BEST GRADES - (COURSE IN WHICH WERE OBTAINED): Corresponding with other items

XII WORST GRADES - (COURSE IN WHICH WERE OBTAINED): Corresponding with other items



spondence. This is because one course in a given department of study occasionally was reported, for example, as the most valuable, and some other course in the same department as the least valuable. The small degree of inaccuracy thus introduced by grouping closely related courses is certainly a less serious difficulty than would have resulted from its avoidance by strict segregation of each course from each other in even the same branch of the curriculum.

As it was, some forty different categories were used. Analyses of College, Sheffield Scientific School, and Freshman replies are separately presented in the accompanying graphs.

The inference from these analyses consistently reflects the contrasting opinions held by undergraduates concerning elective and required studies respectively. Without exception, the more favorable reactions are associated with those courses in which the student's major interest lies. Whether or not these opinions are justified is not here the point at issue—that they are held is the important factor.

The field a student has elected, elicits from him the most time and intellectual effort, yields the greatest satisfaction, and appears to him most valuable. The courses he has been required to take despite his lack of interest therein, on the other hand, not only are felt to be of least value, but call forth least effort. The student spends least time on such courses and derives, by any criterion of his own, least benefit from them. Under such circumstances, it is only natural that his worst grades often are obtained in these same required courses.

Grades are clearly not the determining factor in such student opinions however. Inspection of the correspondence ratios between "best grades," and other criteria shows, for instance, that "best grades" are obtained at least as frequently from courses upon which least time is expended, as from those requiring most time. Thus the existence of "snap" courses is objectively (though perhaps unnecessarily) evidenced. In this situation we may find further reason for the nonexistence of any positive relationship between classroom averages and time spent in study.

Nor does the student always feel that the most valuable course is the one in which he gets the highest marks. The courses Freshmen regard as most valuable, in particular, seem to reward this appreciation with poor grades almost as often as with good ones. That this phenomenon does not characterize upperclass votes in quite the same degree may be due either to subsequent avoidance of subjects which give trouble, or to the eventual acquirement of greater facility in those whose value has been most appreciated. In other ways as well, it is apparent that opinions regarding courses have not by any means been wholly determined by the grades received therein.

The correspondence of favorable comments with elective courses on the one hand, and of unfavorable opinions with required ones on the other, is, as might be expected, less pronounced for Sheffield Scientific School students than for those in Yale College. The Sheffield men are following Engineering and Science courses, rather definitely prescribed by their nature. These requirements are in general related to the central core of the student's major interest and therefore probably acquire in his eyes meaning and justification with which the liberal arts man may never invest requirements of a quite different type,

largely *unrelated* to his chosen subject. Does this not suggest that in the vocational course, or in any field of concentration, requirements may have their proper place as serving and illuminating the student's major aim, while various requirements *not* cogently related either to such basic aim or to each other may fail to achieve their purpose?

VALUE OF COURSES DEPENDENT ON STUDENT'S ATTITUDE

THE evidence here presented contradicts the theory that certain fields of knowledge are of themselves so essentially educational as to prove valuable even to those forced unwillingly to study them. It is reasonable to infer from our data that the value of such subjects to the individual is proportionate to his effort and interest therein, rather than inherent in the subject matter itself independently of the student's attitude. We have already seen the favorable influence upon academic work which is exercised by definiteness of orientation. This realization of a purpose (not, of course, in any narrowly vocational or utilitarian sense) makes for meaningful appreciation of educational values and alone can give the student, we feel, an interpretation which he can understand and by which he will be stirred. If his interest is not so aroused as to motivate the student toward a subject, mere exposure to it is not likely to prove educationally stimulating or beneficial. Unless requirements can be tied up in some way to the individual's major interest, and interpreted for him in terms of their relation to his basic purpose, then, according to our data, these requirements become futile and meaningless (1, 2, 3, 7, 96, 102).

It may of course be argued that students, while still in college, cannot realize the true value of their courses. Many who decry some particular subject as seemingly of little merit at the time, come later to appreciate its genuine worth. We therefore base our argument chiefly upon the actual subjective influence upon students during their undergraduate years, which these reactions to arbitrary requirements indicate. Whatever value, despite the system herein criticized, an individual may later realize from some imposed courses, it is at least reasonable to suppose that he would obtain even greater worth from the same courses were his attitude toward these subjects more favorable at the time he is actually studying them. Hence our plea for more emphasis on orientation and purpose, realizable by the student, and for greater flexibility in adapting the curriculum to individual aims and interests.

Granted further that there may be a genuine educational value in the faithful discharge of even irksome intellectual tasks, our contention here is that such values do *not* attend mere perfunctory compliance with such assignments. We wish to emphasize that our criticism is not based on the lack of *potential* inherent value in the subjects required, but merely upon the ineffectual results obtained from any course, if the student's interest therein is alienated by the negative conditioning which arbitrary compulsion seems to induce.

This concluding investigation of required and elective courses seems to have demonstrated even more forcibly than did the preceding type of analysis, how important an educational rôle is played by *purpose which the student himself can understand and appreciate*. Such purpose is after all the most natural and effective intellectual stimulus to favorable academic work (136, 138).

WHY EXTERNAL FACTORS CAN AFFECT PERFORMANCE

THIS final analysis in fact suggests *why* external and secondary factors can influence students' academic work to the degree previously observed. We believe this is simply because the great body of students is, as a whole, so *little* motivated that even relatively unimportant and indirect stimuli can exert an appreciable effect upon their grades. If, even after eliminating differences in potential ability, variations in the definiteness or direction of students' occupational aims can significantly influence their academic records, does this not disclose lack of inspiration for the great majority of undergraduates? Could men handicapped by having to work their way clearly surpass in scholarship their intellectual peers, if the latter were really stimulated intellectually? Finally, would student activities motivate students academically in even the slightest degree if the course of study itself offered adequate inspiration? We believe the true significance of our findings lies not so much in evaluation of the motivating effect of certain external factors as in demonstration of how little stimulus must exist for most students, in order for these factors to exert any material influence at all.

The evidence just analyzed suggests further that lack of emphasis on curricular purpose is at least one important cause of this general intellectual apathy. Requirements so complicate the student's choice of courses that much of his work lies outside of his major interest and even interferes with its pursuit. He complies perfunctorily with the regulations and gets his degree, but derives in the process less benefit than he would, if any real purposive motivation were capitalized to a greater extent. Granted that many students are without any such real interest—is it necessary, for their sake, also to restrict the ones who might be genuinely stimulated? Our data suggest that elaborate distribution requirements in fact nullify the possible value of much of our students' curricular work.

As Richardson has said (7), "The essential difficulty seems to be not in the principle of distribution but in the principle that anyone is wise enough to select what all boys must study"; and again, "In general the more compulsion we exercise upon the individual in the choice of the subject matter which he is to study, the less effective are the results. . . . The very existence of such prescriptions is a confession that the college is not succeeding in its purpose of arousing intellectual interest" (pp. 171 and 172).

That there is justification for such objection to hard-and-fast requirements of distribution, related in no positive way to the student's major interest and frequently purposeless in his mind, seems definitely evident from study of the preceding graphs.

THESE RESULTS NOT REFERABLE TO PARTICULAR COURSES

It should be emphasized in this connection that within the range of requirements there falls much of the curriculum. What is an elective for one man may be a requirement for another. Our argument is therefore not directed against any specific subjects but merely against the theory that forcible feeding of any course, however valuable it may be to the man interested in it, is not likely to prove nourishing to a protesting victim of the experiment. Furthermore, exponents of the educational value of each of these different courses argue quite naturally from their own experience but are apt to overlook the fact that *for them-*

selves the subject acquired a special value and meaning because it represented their major interest. Have either languages or the sciences obtained scholars of note through the medium of required courses? Have leaders in these fields been developed from men who were exposed to them initially against their will? To such questions we have no answer; but is it not equally possible that such exposure, like vaccination, is apt to raise the individual's resistance and make him immune to further interest in the subject thus forced upon him? The evidence offered at least tends rather toward the latter interpretation.

Detailed study of the opinions analyzed in this section, regarding value derived from and effort expended upon different courses, has strongly convinced the writer of the reliability, honesty, and authenticity of students' replies on this subject. It has also been apparent that the element of prescription in itself, rather than the nature or subject matter of the particular course required, is the fundamental cause of dissatisfaction expressed. Accordingly we do not believe that we have either exaggerated the credibility of our data or overdrawn our interpretations thereof. The writer, it must be confessed, formerly held views on this subject very different from the present ones, but found his previous opinions so strongly contradicted by the evidence of this investigation as to be no longer tenable.

We therefore feel that the foregoing analysis justifies the following conclusions:

1. Specifically required courses of study are likely to prove less valuable educationally than those a student elects.
2. This becomes particularly true when such requirements are not related in any direct way to the student's major field but dictated merely in the interests of distribution.
3. The purpose for which certain studies have ostensibly become established as curricular requirements—intellectual breadth—is unlikely to be attained through arbitrary prescription.
4. In curricular planning, every effort should be made to capitalize the value of purpose (not in any vocational or narrow sense) so that a student's course of study will take on meaning and acquire a unity which typically it now lacks.

SUMMARY

IN the present section we have presented an analysis of student opinion regarding subjects of study and the relationship, to elective and required courses respectively, of comments regarding the value derived therefrom. Replies were first analyzed in reference to particular subjects of study. English, History, and the Social Sciences received the largest proportion of favorable comment from Yale College students while the Natural Sciences, Classics, and Modern Languages appear to be regarded as of less value than the other College subjects and to call forth less time and effort from the students. It is interesting to note that best and worst grades divide almost equally for all of these subjects with the exception of English (in which the percentage of best grades exceeds that of worst grades) and of the Natural Sciences, in which this situation is to some extent reversed. Evidence in other respects indicates that the marks received in these respective subjects probably represent different degrees of application rather than variations in the marking scale.

Results for the Sheffield Scientific School, whose curriculum is more specifically prescribed and more definitely vocational, are not so clear-cut as those for the College. English and the Social Sciences, however, appear to be regarded in that school as particularly valuable, which is interesting in view of the fact that they are generally regarded as humanistic rather than technical courses. The Freshman opinions are to some extent a compromise between the two other groups.

Our next consideration of this topic was based on analysis of the correspondence between replies to different questions, *irrespective* of the subject of study involved therein. A series of charts has been presented illustrative of the percentage of agreement in subjects of study mentioned in reply to the twelve different questions asked about courses. This degree of correspondence, or relationship of each such question to each other one, was based not on particular study groups but merely on the *coincidence* in subjects named.

Striking uniformity of relationship was discovered as to favorable comments regarding elective courses on the one hand, and uncomplimentary comments about required subjects on the other. This relationship seems definitely to be associated with the principle of election versus requirement, and not merely to reflect popularity or disfavor of any particular subject or course. Analysis of the correspondence between such questions as those dealing with grades received, value to the individual, time and effort expended, etc., furthermore indicate that the replies represent frank and honest opinions not unduly influenced by marks.

We found less tendency among Scientific School students to criticize required courses. This is only to be expected in connection with a curriculum of specialized purpose, wherein requirements are related to the major body of a student's interest and aims. The tendency for electives to elicit favorable comment and requirements unfavorable ones, is in general evident even among Scientific School students but is not so conspicuously and consistently pronounced as it is in the case of the Yale College men. A student's initial major choice presumably expresses the field in which his natural and direct motivation is most readily aroused. This core of interest seems from our data not only to offer the possibility of direct academic incentive of itself but also to suggest the most logical and effective means of stimulating interest in other fields, provided these can be purposefully related to a student's predilection, rather than arbitrarily imposed upon it. It is therefore suggested that concentration rather than distribution should be the determining factor in curricular planning.

From a different angle, therefore, we have again found purposive motivation of great importance as a potential influence upon scholastic effort and achievement.

The external, indirect, and secondary factors previously studied can exercise an appreciable effect upon students' grades only because the course of study itself offers most students inadequate direct stimulation. Our earlier findings therefore suggest how insufficiently we have capitalized, in the course of study, *the inherent value of purpose so interpreted that the student can appreciate it*. Complicated distribution requirements, often without meaning for the student and outside of his major interest, appear particularly to conflict with that purposive motivation so essential to the educational process.

XI.

GENERAL INTERPRETATIONS

HAVING apparently carried our investigation as far as limitations of the data will permit, we shall now attempt to integrate the various findings. Originally we suggested that students differed in respect to (1) ability, (2) experience and study habits, (3) external factors, and (4) incentive. The most important of these influences upon academic grades we concluded to be that of potential scholastic ability. As this is measurable to a considerable degree by Mental Ratings, we have suggested that these be allowed increased weight in selective admission. Experience and study habits we have not been able to analyze quantitatively, and have had to assume that differences in these respects, and also in health and physique, are distributed at random among the groups studied and consequently that they introduce no appreciable error into our calculations.

Analysis of the external factors has suggested that Degree of Orientation, Economic Status, Professional Aims or Background, and probably Purpose in Coming to College exercise, in the order named, significant influences upon students' academic records. Comparison of correlations between Mental Ratings and Grades for students differentiated in these respects suggests furthermore that these factors may largely prove effective because each expresses, in its own respective way, variations in academic motivation. Further evidence as to the possible academic stimulus apparently afforded even by two types of secondary or extraneous motivation—scholarship aid and extra-curriculum activities—supports this inference.

Thus existence of the first of our postulated set of differences—ability—has been demonstrated; the second—experience—not analyzed; while the third and fourth—external factors and incentive—prove to be really one. They represent in fact mutually complementary phases of the same influence, purposive motivation. The different conditions which they express are causes of the varying degrees of motivation related to them; and the variations in motivation in turn account for the grade and correlation differences associated with these factors.

The significance of external influences upon value derived by students from college, therefore, appeared from these further analyses to be confirmed. Study of the contrasted groups on the basis of their extra-curriculum and total achievement also supports the previous evidence as to the secondary motivation induced by extra-curriculum activities. Thus we are forced, after quantitative analysis of wholly objective data, to the perhaps disturbing and certainly paradoxical admission that students, at least in Yale, appear to do somewhat better work because of the secondary spur of extra-curriculum affairs than they otherwise would accomplish. The primary and natural incentive offered by the course of study alone is evidently insufficient.

IMPLICATIONS OF THESE FINDINGS

THE important thing, we feel, is not so much these individual differences noted in them-

selves but what, in a broader sense, they imply. Taken all together they evidence primarily the academic importance of purpose—which, in one form or another, they all express, and which is the general and underlying motive for them all. They show how responsive undergraduates are to the stimulus of purpose. Furthermore, they suggest that lack of sufficient educational incentive must characterize the student body as a whole. Were it otherwise, such external and secondary factors could hardly affect appreciably the total academic record of large student groups. For if the curriculum itself afforded adequate purposive motivation on its own account, the effect of these indirect influences would be unlikely to emerge, in any significant degree, from the midst of such a complex total situation.

These deductions seem to offer ample justification for the oft-repeated criticisms which have recently been showered so abundantly upon the typical course of study in American colleges. Surely where the apparent and avowed purpose of the institution—study—can of its own right command so little attention from young people whose ability and essential eagerness no one in contact with them can possibly question, something is fundamentally lacking. The suggested partial reliance of the curriculum, due to its own defects, upon even extra-curricular interests as affording, in a negative and unsatisfactory way, at least more of a stimulus for academic work than the course of study seems of itself to offer, is a striking and depressing proof that all is not well with educational procedure. Indeed, our findings in this connection do not so much offer a defense of student activities and of the over-emphasis upon them, as they justify criticism of such curricular shortcomings as make this situation possible.

ONE CAUSE OF STUDENT APATHY

ANOTHER type of analysis suggests at least one possible reason why students fail to find in their course of study the essential purpose necessary to their true intellectual stimulation. Objective evidence has been presented to show that students do less valuable and effective work upon required courses than they do upon those they have elected, because upon courses they are forced unwillingly to take, they expend less time and effort than they do upon those in which they are really interested. It furthermore appears that this tendency is most pronounced when the requirements lie outside the field of concentration, in furtherance of the principle of academic distribution.

From these data we have argued that distribution requirements of themselves appear to be relatively valueless and, unless they can be related to the student's major academic interest, that they are not likely either to stimulate him or to serve the purpose for which they are intended. In fact the concentration requirement is one to which the student evidently may become reconciled as its purpose subsequently unfolds. This same process is likely however to work *against* his acceptance of a distribution requirement because the latter tends to interfere with the pursuance of his real interest. In the one case initial objection is overcome through the influence of positive conditioning; in the other negative conditioning only serves to intensify the original opposition.

Lack of purpose in the present typical curriculum seems in fact attributable in no small

degree to arbitrary distribution requirements. We feel, unless their purpose and relation to his central objective can be made clear to the student, that such requirements in fact do distinctly more harm than good. We also maintain that the quantitative nature of our data gives these contentions greater weight than mere opinions, pro or con, properly should receive in connection with a subject so long debated. The very fact that years of argument have led to no consensus of opinion on the topic indicates that conclusive agreement awaits further quantitative analysis. While we make no pretension of having reached a final answer the nature of our evidence furnishes at least a definite objective basis for the present discussion, thereby strengthening its claims as compared with those not so supported.

PURPOSE, THE FUNDAMENTAL STIMULUS

IF we now look back over all the phases of this investigation we find one common explanation for our various findings, that *purpose, appreciable by the student, strongly influences his academic motivation and, thereby, his accomplishment*. Even a high degree of incentive and effort, to be sure, cannot overcome genuine deficiencies in ability but there is no reasonable doubt that the college man of average or superior potentiality is on the whole inadequately motivated by the curriculum as it stands. We have, indeed, good authority for maintaining that the intellectually most promising student has, in this country, for some time been the least stimulated and the most neglected in this respect.

Of late the development of Honors Courses, planned on a level high enough really to interest our better students, has demonstrated the possibilities of more purposeful educational procedure. New types of curricula in certain Universities indicate that rather similar methods may with advantage be applied to a much larger body of students than Honors Courses, by their very nature, can accommodate. Either procedure—or a combination of the two—gains its success from the greater meaning envisaged in the curriculum by the student, and his resulting eagerness to accept great academic responsibility. More freedom increases his initiative and self-reliance and more unity of purpose in the curricular pattern stimulates him positively, beyond what any purely negative incentives such as enforced attendance or eligibility requirements—both *reductiones ad absurdum*—can possibly do.

BREADTH OF MEANING NECESSARY

THE success of these new methods—in their essence long familiar abroad—seems sufficient evidence that the greater purpose so desirable in our curricula need not be narrowly or vocationally conceived. The contention has been advanced that American college students are less intellectually inclined than those of England or the Continent, largely because they are, for the most part, planning to enter business. We have seen from our study of occupational intentions that there is some ground for this argument. The more purposeful type of curriculum and the Honors Course, however, have made their appeal alike to students of all classes. If there *are* genuine values—as the writer for one firmly believes to be the case—in classical and other liberal studies, surely a clearer interpretation thereof to the student will not destroy or undermine them. Just such insight is what originally gave

meaning to our collegiate instruction in earlier days, when students themselves realized the applicability of undergraduate studies to the professional life for which they were then chiefly being trained.

We must bear in mind how conditions and educational demands have changed since the time described in Professor Richardson's *Study of the Liberal College*. "In the old colonial community the clergyman, as in lesser degree the lawyer and the teacher, was the man of ideas. He was no mere teacher of the gospel and tender of the parish. While people lived their lives it was his task to reflect on living, to formulate the belief on which it was based; to study the conditions by which it was molded; to bring to clearness the problems by which it was faced; to study the moral, social, economic, political situations of which it was constituted. It was his part and the part of men of like intellectual development to attempt to understand the lives which other men were living with lesser degrees of understanding. It was his task to serve as a prophet and seer, as guide and counselor of his people. It was for that task that the liberal college was intended to prepare him" (7, p. 12).

A vast increase of late years in the sheer body of human knowledge has of course tremendously complicated the educational situation. Subjects with which, in the period referred to by Richardson above, the educated man was quite familiar have since expanded in content to such a degree that, despite tradition, they can today be crowded into the liberal curriculum only through surrender to superficiality. Yet the fight for retention of all the old material, plus that for inclusion of much that is new, goes on unchecked.

A recent critical essay by Miss West, *Machines and Civilization* (152, p. 6), contains a stimulating passage illustrative of this point:

"There is too much to do. That, surely, is the stultifying factor in this modern civilization. To get a fair view of as much reality as is known one ought to do innumerable things: to speak and read three languages, at least English, French, and German, and to read the more important books published in each one of them; to see all the best pictures in the world and track out the new ones in their birth lairs; to hear all the good European music, past and present, and train the ear to an approach to other musics of the world; to have an intelligent knowledge of all the sciences; to have a first hand view of all political and social systems. In fact, one ought to live for a hundred years and carry throughout an equipment of all kinds of genius; and even then one would have no time for creative work. Simply it cannot be done. Yet we know that we need to know as much of reality as possible to chart our way through life; and there is a convention, born in a day when the sum of knowledge was less, that we ought to be able to master nearly all that is known."

Curricula have indeed been fearfully and wonderfully modified of recent years in the attempt to adjust them to newer demands. But instead of developing modern interpretations and meanings for the older basic educational values, whose application surely is still real today, these have been left largely unconnected, in the student's mind, with his life concerns.

It is by no means our desire to see the course of study become further vocationalized; rather, in fact, the reverse. We contend, however, that cultural values must today be given

an interpretation which the modern student will accept and understand. The older unity of professional and educational aims no longer automatically provides that interpretation for the great body of students, as it once did. Indeed doctors themselves disagree so frequently today about the value and purpose of different studies, that it is small wonder the student has often a foggy perception, at best, of why he must take certain studies in order to become "educated." A "liberal" college degree even at our most conservative institutions may in fact recognize credits obtained in no small part from courses rather frankly vocational in content, with a seasoning of the older and more purely educational disciplines.

In such a situation there is no fundamental community of interest or purpose in the two types of training, often separated from each other, at least in the student's mind, as if in separate compartments. The one part of his curriculum is "educational" and the other "practical" and he perceives no interrelation and makes no synthesis between them. The student may think he sees a reason for the "practical" courses—but these evidently do not fulfill his educational needs to the institution's satisfaction, because he must complete certain "cultural" courses as well. But these latter, without which he presumably cannot be "educated," are not interpreted to him in terms of any basic purpose. Thus "purpose" gets into one compartment and "culture"—as if it would necessarily become contaminated by being given meaning—is stuck into another. No basic principle suffuses or binds together the two into one whole (6).

As Flexner has written in this connection, "Ought not colleges to be so organized that students, instead of floundering from course to course and from year to year, lost in the mazes of a menu out of which they cannot possibly know how to construct a square meal, may focus their main efforts on an important goal and actually reach it?" In the same article this keen critic neatly summarizes the problem as follows: "Concentration and dispersion are so nicely adjusted that the student is expected to hit a bull's eye and simultaneously make havoc in a covey" (2, p. 733).

NEED FOR GREATER DEPTH OF LEARNING

IF such comments are not unjust, there would seem logically to be only two ways out of this present dilemma—one a further reduction in liberal courses as failing to serve their intended purpose because they lack meaning for the student; the other, restoration of *greater* emphasis on the cultural subjects, so interpreted as to recapture the purpose formerly more apparent in them, and which we believe they still essentially possess. Present procedure, by insisting on distribution at the expense of concentration, not only fails to capitalize any real interest the student may have, but steers perilously close to the modern pitfall of shallow learning. When fifteen minutes a day with a scrapbook and even less diurnal exercise in French satisfy thousands that they have acquired "polish" there is all the more reason for colleges to eschew like superficiality. Yet in their insistence that *every* student must be "well-rounded" and know something about each of a standardized group of subjects—irrespective of his particular interests or individual capacities—they are apt

to discourage or actually to restrain him from really thorough application to any one thing whatever.

In an age of tabloid culture and ready veneer, is it not after all incumbent upon our liberal colleges to rediscover the true values in our great humanitarian disciplines? Can these not be so reinterpreted to students that they will find therein a real meaning, a genuine application of educational breadth and background, in terms not of narrowly vocational or materialistic uses, but of the lives they are to lead? If the true aim of education is so to stimulate the mind and arouse intellectual curiosity as always to lead to *further* study, then the ultimate implications, in a broad sense, of college work to later life must be far more stressed than at present is the case.

IMPORTANCE OF ATTITUDE

WE must discard the notion that a man becomes "educated" by acquiring such and so many "credits" and by exposure to this and that subject, and replace the present emphasis on the content or nature of certain studies with attention to the student's *attitude*. For, as we have seen, purposive motivation, however aroused, is a most important determinant of real educational achievement. If we can put greater meaning, then, into the course of study—if we can turn our attention from petty departmental differences and consider instead the fundamental question of how the student's attitude can be modified—the conflict between vocational and liberal studies will be readily and naturally resolved. True education should once more be related, as it once was, to life interests and values if it is to recapture meaning and put down the threat of materialism. Culture must, through courageous reënnunciation of its values, conquer, not compromise.

Though this discussion has strayed somewhat beyond the province of demonstrable fact, it is but a restatement, for which we have at least sound authority, of the charge that colleges themselves have failed to meet their own problems squarely. Dean Holmes has said (3, p. 495) ". . . but seldom have we carried through and applied in our colleges or schools a searching inquiry into educational values. Our discussions tend to degenerate into academic logrolling. The weighting of a subject for admission credit or the maintenance of a specific requirement for graduation becomes a political storm center in a college faculty or an association of school and college teachers, much as does the duty on a given product in a new tariff measure in the National Congress. We avoid fundamental educational discussion," and Doermann (87, p. 96), "the prospective college student will search most college catalogues in vain for a statement which conveys in terms intelligible to him what the liberal arts college aims to accomplish. What college today has invited students on the basis of a clear definition of its purpose?" To quote Richardson again, ". . . it seems evident that much of the criticism of the college is based upon the failure of its component parts to recognize what its purpose really is, or if that purpose is recognized, to fail to act intelligently toward its attainment" (7, p. 23).

Through criticism by other high authorities runs this same note, that a new appraisal and statement of its real aims, in terms which the student can appreciate, must be made by the

college. If the institution does not know its own mind, small wonder that the student is perplexed.

THIS CRITICISM NOT OF YALE PARTICULARLY

THE writer may here be permitted the parenthetical explanation that although these criticisms are based upon a survey at Yale, they are by no means directed specifically against his own University. He believes they apply with equal if not greater force to most of our institutions of higher learning. Yale's splendid student body and the recognized strength of her faculty deservedly command respect. But Yale, in common with most other Universities, has been buffeted by so many cross-winds and currents that her educational procedures are certainly not above criticism. Nevertheless, she has held by certain ideals far more steadfastly than have most institutions and for that reason the comments above in fact may well apply in less degree to her than to many others.

In her recent successful extension of Honors Courses, Yale has indeed strikingly demonstrated the effectiveness of methods we advocate herein. Warm appreciation of these developments, among students, is attested by their suggestions as to how educational procedure may be still further improved (Appendix D).

SUGGESTED FUTURE POLICIES

FROM the evidence presented in preceding chapters, what constructive measures may we look to for amelioration of the conditions which we, and many others of far greater experience and authority, have attacked?

Our findings and the suggestions derived from them in so many ways agree with those previously reached by Professor Richardson that this investigation almost appears to have been planned as an objective confirmation of his *Study of the Liberal College* and as a corollary thereto. That work indeed is so stimulating as to have proved exceedingly suggestive and helpful. As a matter of fact, however, the present writer did not read that report until after the Student Survey and much of the statistical analysis thereof had been completed. Though Professor Richardson's exposition is so clear and cogent as hardly to need any such gratuitous support, the fact of agreement in general between these two studies, so different from each other in method and approach, is a coincidence which of itself perhaps lends added force to them both.

We shall therefore take the liberty of reproducing here certain of the specific recommendations for revision of the college curriculum with which Professor Richardson concludes his *Study* (7, p. 280).

1. A curriculum based on the theory of capitalizing the interest of the individual.
2. An abandonment of the principle that acquaintance with certain subjects is an absolute necessity for the educated man, with the consequent elimination except in Freshman Year of prescribed courses, or those with narrow options.
3. The provision for a major requiring a considerable portion of the later years of the course; a major

- which shall be planned as a coherent whole, and which shall call for work of a different type from that now required.
5. Suitable guidance for the entering student, but guidance with the purpose of fitting him as soon as possible to assume responsibility for himself.
 10. Insistence in the classroom, as at present, on mastery of essential facts; but the main emphasis placed on the use to which the facts may be put.
 16. A comprehensive examination in the major subject.
 17. Careful attention to students of exceptional capacity, so that they may be permitted to use that capacity to its utmost extent. Some form of the honors course.
 19. Emphasis on good teaching, and assurance of due rewards to the teacher of proved excellence.
 20. Reappraisal of the relative value of teaching ability and skill in research.
 26. Student participation in discussions of college policy.

AGREEMENT OF OUR DATA WITH THESE CONCLUSIONS

It has not seemed advisable to discuss in preceding pages the importance of able teaching and of students' opinions concerning it. Questionnaire data on this topic however will be found, in Appendix D, pp. 163 and 167, to offer objective substantiation of recommendations 19 and 20 above. The other statements quoted are clearly expressive of the conclusions we have independently reached by quantitative analysis. We have already emphasized our belief that student cooperation in this Survey and the value of information obtained therefrom justify increased confidence in undergraduate criticism even on matters of educational procedure.

This investigation will, we feel, have served a useful purpose if in any way it encourages colleges to seek out more freely the opinion of students, and to give them a chance to further the improvement of educational policies. More enlightened appreciation by graduates of many of these problems is essential to their wise solution. Today's students are tomorrow's alumni; their future sympathy and interest will be the more helpful if they can now participate in discussion of these matters which so vitally affect their own interests and development. The old methods no longer suffice and it is from the undergraduate himself that we can best learn why. It is after all he who feels most keenly the lack of purpose in existing curricula, and if we are to get the most effort from him, we will do well to find out what he himself thinks.

In this study we have suggested that certain factors may be used in selective admission, as supplementary to other criteria. Their function would be to reduce the proportion of those who cannot, or do not want to, profit sufficiently by the educational process to justify their going to college. It will never be possible to eliminate in advance all the triflers or dullards. Some improvement however, we suggest, would result from increased attention to the factors of influence whose effect upon academic motivation and consequent scholastic success has been demonstrated. But the more selection is improved by these or any other methods, and the more really serious-minded and able a student body we consequently obtain, the more important does it become to infuse our curricular plan with such a real purpose as will insure fruitful cultivation of this potentially superior group. If we cannot

properly stimulate our students and arouse their intellectual curiosity, picking them more carefully will be effort largely wasted.

Perhaps even now this explains the student demands and criticisms regarding present-day curricula. Especially among the older institutions with limited enrolments the press of numbers has increased the competition for admission and so has raised the standard of entrants. Meanwhile the curriculum has not advanced to meet the demands of an intellectually keener body of students. Small wonder that they indite protests and petitions.

IMPORTANCE OF FRESHMAN COUNSELING

PURPOSIVE motivation offers, as we have seen, the most powerful and natural means of stimulating undergraduate interest in academic work. This might appear so obvious as to discredit our reiterated emphasis thereon, yet our present curricular system fails in large measure to recognize and utilize this fact advantageously. Accordingly we suggest greater assistance to Freshmen in planning their course of study and particularly to cultivation in the student's mind of perception of a unified purpose. Too little initiative is taken in this respect by colleges and Freshman Advisors. We do not advocate paternalism, of which there is too much in other respects already, but we do hold that much more can be done than heretofore by interpreting curricular purpose for each student individually and in terms of his basic interests. It is too much to expect of the raw Freshman that he can do this for himself.

An obvious reason why this has not been more effectively attempted before is that faculties do not in general recognize professionally the importance of this advisory function. Yet the whole value of subsequent study for many students can be so materially enhanced by fostering the right intellectual attitude from the start of Freshman Year that the development of this attitude seems to be *the most important function of a freshman year*. We have seen how great is the influence of orientation on academic motivation. Both adequate compensation and definitely professional recognition should be the acknowledged rewards for effective service in the counseling field, whose potential return in value, to students and to the institution, cannot well be overestimated. Such work is laborious and exacting. To be properly carried on, it requires ability of the highest order and it should accordingly be given status and recognition on a par with any other field of educational endeavor.

FRESHMAN COUNSELING AND THE INDIFFERENT STUDENT

THERE is no doubt that an unfortunate absence of any genuine intellectual interest characterizes not a few reasonably intelligent students. Many of these cannot properly be eliminated on strictly academic grounds, either before or after matriculation, and any effort to deal with them coercively in this respect would probably result merely in a deceptive announcing of interests which in point of fact they do not possess. Whether the schools or the homes are at fault at this point is a matter of speculation. But there is little doubt that a considerable number of students, who are able to pass even relatively difficult entrance examinations with reasonable credit, thereafter prove to be devoid of any serious interest

and ambition beyond that represented in extra-curriculum and social prestige. This difficulty in some cases is magnified by the lack of appreciation of specifically intellectual achievement in such students' homes. Recognition of this difficulty however does not justify faint-hearted resignation thereto. Even though it seems likely that this particular type of intellectual apathy can never be entirely eliminated, it seems not unreasonable to hope that effective methods of counseling and orientation may appreciably diminish its now admittedly unfortunate influence.

If such a desideratum is to be realized at all, logic suggests that the process of attempted intellectual stimulation should begin as early in the Freshman year as possible.

The great difficulty in procuring the type of advice for Freshmen which would be desirable is, of course, the relative paucity of individuals sufficiently well informed over the general field of education, and in possession of those qualities of lucid and stimulating exposition which make such advice generally acceptable. While this is a serious difficulty, we believe it may to a large measure be met, once colleges sufficiently realize the importance of this function to reward its successful discharge adequately and honorably.

This emphasis on orientation and concentration, as the principles offering most hope of genuine educational progress, is strongly supported by Kelly's (149) recent analysis of curricula for the 26th Year Book of the National Society for the Study of Education.

Consideration of individual aims, needs, and interests; sympathetic advice (not arbitrary compulsion) as to how the desired values can best be secured from the curriculum; and sufficient freedom to facilitate carrying out the desired plan, are all essential to attainment of a true educational purpose. Mass legislation based on the assumption that compromise decisions with respect to the "average student" justify complicated compulsions which *every* student must thereafter conform to, should, we feel, be frankly discarded. Our evidence indicates that such arbitrary requirements are essentially purposeless and futile. We advocate therefore more individual freedom and a greater measure of concentration, both proportionate to the student's real interest and ability. Greater academic motivation would then also make possible higher standards of achievement. In fact, as President Angell (5, p. 6) has said, if we expect a student to put forth more real effort, "we must seek to call into action the motives by which he is actually impelled."

DISTRIBUTION RELATABLE TO CONCENTRATION

THIS suggestion does not contemplate a so-called wholly "free-elective" system. The requisite concentration and emphasis on a unified plan of study would prevent any disorganized jumble of ill-assorted courses—such as in fact too often occurs under the present system. The distribution really essential to a properly rounded course should be explicable to the student in terms of its relation and value to his major interest. We have seen the futility of arbitrary requirements, taken not with any interest or purpose but only to satisfy regulations as to distribution. Compulsion of that nature apparently defeats its own ends. Students are more apt to respond to reason than they are to profit by forced exposure to requirements largely inexplicable from their point of view.

The very process of uninterpreted compulsion itself is in conflict with recognized pedagogical laws, as it tends to set up a resistance inhibitory to the learning process. Surely no study is so magical that it can "educate" without effort on the student's part. Teachers themselves are in continual strife as to what subjects are essential parts of every educated person's equipment, unmindful of the fact that they can never agree on such a fantasy because education after all is a process and not a commodity. As President Lowell (102, p. 248) has recently said in another connection, "Education consists less in the number of things a boy has glanced at than in the way he has learned to regard them," and again, "Education is not like trephining the skull, where the surgeon puts something in the patient's head while he is under the anesthetic. The brain is not exempt from the general biological laws that any organ grows by exercise, and is atrophied by disuse."

CONCLUSIONS

WE may now state our final conclusions as follows:

1. Certain secondary factors of influence (Economic Status, Definiteness of Orientation, Professional Background or Interest) tend to motivate students academically. Together with measures of capacity such as scholastic aptitude test ratings, these indices may be advantageously used as supplementary criteria in selective admission.
2. Extra-curriculum activities, which at present also serve in some degree as secondary factors of academic motivation, should not be arbitrarily banned. Academic and extra-curricular achievement are not necessarily or essentially incompatible.
3. The influence exercised by these various factors is attributable to the purposive motivation of which they are all expressions and which underlies them as a basic motivating force.
4. The fact that the secondary purpose underlying these factors exercises as much influence as it does, indicates that the curriculum, of itself alone, offers inadequate incentive to study.
5. This deficiency of the curriculum is largely due to lack of sufficient purpose discernible therein by the student.
6. Extension of the principle of distribution to the point where it represents meaningless compulsions put upon the student, often in conflict with his real academic interests, is an important contributory factor to this unsatisfactory situation.
7. Increased attention should be given to orientation of the Freshman and to assisting him to plan a purposeful, unified course of study, viewed as a four-year whole. The importance of orientation as an influence upon students' grades has been clearly demonstrated.
8. Concentration rather than distribution should be the curricular desideratum. Avoidance of overspecialization may be obtained through taking a sufficiently broad view of the field of concentration to require familiarity with subjects outside of the student's major interest, by emphasizing their relation to it.
9. Arbitrary requirements and mass legislation affecting all students alike, unmindful of

the differences between them, should be replaced by a course of study sufficiently flexible for adaptation to individual needs and aims, with emphasis on the purposeful relation of its parts to each other, and of the whole to the student's life after graduation. Above all it should aim to capitalize intellectually his major interest.

10. Students have demonstrated the worth of their opinions, their interest in educational matters, and their willingness to coöperate in studying them. Consequently college faculties and administrators would do well to facilitate participation by students in conferences on matters of educational policy or government, and to encourage healthy student criticism on such topics.

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APPENDIX A

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APPENDIX B
QUESTIONNAIRE AND TIME CHART FORMS

YALE UNIVERSITY STUDENT SURVEY

MEMBERS OF THE STUDENT COMMITTEE

Executive Committee

E. P. Cottle, Jr. '26
F. A. Potts '26
R. L. Post '27
G. H. Walker, Jr. '27
D. Bartholomew '28
Edward Lagalle, Jr. '28
R. N. Jessop '28
C. D. McCoy '28
C. C. Lanphier, Jr. '28
J. A. Sanford '28
B. S. Cookman '29

A. L. Ferguson
P. B. Hopkins
J. H. Joss
C. Klogg
E. T. Neutleton
P. H. Robinson
F. F. Russell
J. W. Simpson
J. W. Smith
C. L. Stillman
W. S. Stewart
G. D. Stout
D. P. Taylor
F. E. Wattles
D. K. Walker
W. H. Donahue

1927
G. H. Walker, Jr.
P. W. Bunell
W. F. C. Guest
J. D. Mungier
J. A. Stringham

A. P. Stokes
V. B. Talliaferro
F. E. Calhoun
G. Sturdivant, Jr.
F. Robinson
J. C. Ross
L. M. Noble
S. N. Scott
W. R. Clark
G. T. Pusey, Jr.
H. B. Mosie
R. Dana

1928
D. T. Bartholomew
A. E. Barker
G. B. Beecher
G. B. Berger, Jr.
C. T. Bingham
B. Caldwell
S. W. Carr
J. Curtis
P. Day

A. C. Robinson
S. A. Scoville
N. T. Milliken
H. A. Wake
T. N. Ingham
R. J. Wood
S. F. Kennedy
R. C. Hamilton
G. W. Haight
O. M. Wallop
P. H. Gray, Jr.
J. A. Thomas
M. Knight
A. S. Foote

J. Roby, Jr.
R. Patterson, Jr.
R. O. Mitchell
G. M. Shepherd, Jr.
G. L. Storm, Jr.
R. F. Vaughan
E. B. Beaumont
R. W. Huntington, Jr.

1928

R. N. Jessop
D. Y. Kwal
D. A. Rumery
H. S. Holcomb
C. D. McCoy
E. Ingalls, Jr.
R. W. Jack
C. B. McClelland
D. Gregg
A. C. Moody
F. W. Lauder
C. V. Perrine
S. T. Johnson

1927
R. C. Lanphier, Jr.
C. R. M. Burke
W. E. Clegg
C. W. Garrett

1928
C. H. Sanford, Jr.

A. L. Francisco
E. B. Page
J. A. House
J. S. Gorby
T. P. Field
H. L. Hanson
L. S. Beach

1929

J. A. Brandenburg
C. H. Bingham
J. D. Blake
C. H. E. Milbank
J. B. Whitelaw
H. A. Ranges
D. Davoll
P. K. Fodder
R. T. Shields
Perry Jones
H. W. Wright
Paul Mellon
K. S. Gillespie
F. J. Jenkins
F. H. Shepherd, Jr.

L. D. Eley
J. Lampe
D. Wack
J. C. Vaden
H. B. Robinson
R. P. Bakewell
G. Ashforth
B. S. Cookman
G. J. Coy, Jr.
Thomas Vance
W. D. English
G. Tucker
G. H. Crile
G. K. DeForest
E. T. O'Brien
F. G. Brown
R. S. Baker
J. O. Watson
R. D. Paine, Jr.
D. Lindsay
C. H. Wilkins
H. H. Wilmerding
R. M. Carlisle
J. V. Blair

Please read carefully the following statement

You are invited, through the medium of this questionnaire, to cooperate in an extensive group study of certain data and opinions of interest to Yale University and the student body. This survey has been formulated by students and endorsed by the Undergraduate Student Councils. It aims (1) to collect factual data of importance to future educational and administrative policies of the University; (2) to secure reliable information about the undergraduate body which should prove of interest and value to a large majority of present and future students; (3) to give undergraduates an opportunity, long sought, of expressing themselves on various questions of every-day concern to them; (4) to determine whether student opinion on such questions can, as a practical matter, be thus analyzed and utilized advantageously; (5) to ascertain whether a need for further investigations of an analogous nature and perhaps for a permanent University Personnel Bureau exists; and (6) if so, towards what specific problems, if any (e.g., selection, orientation, vocational guidance, etc.), such future studies might profitably be directed.

The data sought can only be collected from individuals but will be dealt with entirely as a group study. No individual is being studied or questioned as such, nor will any personal application be made to any individual case, of the information secured. The Committee guarantees absolutely that your confidence will be held inviolate. The data will not be accessible for disciplinary, scholastic, or any other purposes than those of the investigation. Statistical group studies will be made, but of course this will involve no consideration of individual names. The data will be of value in proportion to the thought and attention expended thereon by students. Every effort has been made to facilitate the method of recording information but so little data is available on many of the points at issue that the survey is necessarily lengthy. Nor will all the questions raised be of equal interest or apparent value to all students. Every question has a definite purpose, however, and you are asked to answer as fully and completely as possible. Although there are no ulterior motives which the Committee is unwilling to state, it is obviously impractical to try and list the motive for every question. Therefore, you are asked to take it for granted, even though the practical significance of some of the issues may not be obvious, that none has been included without some specific reason.

Any such questionnaire inevitably offers opportunity for waggishness, and it may often be easier to make a humorous reply than a helpful one. Please, however, do not try to be funny.

This survey is fundamental in nature and hopes to establish a basis of fact which will direct the course of future studies. For instance, whether or not students could profit by some mechanism of orientation; whether other than scholastic criteria of admission may profitably be emphasized to a larger degree than heretofore; whether student views on educational procedure can be effectively utilized to stimulate scholastic interest; how much emphasis there really is on extra-curriculum activities; chief factors in determining the choice of a college, of a course of study, of a career, etc.; whether some form of vocational guidance is, from the student's viewpoint desirable—all such questions are basic to the formulation of future policies. Therefore, until the information sought herein is obtained and studied statistically, the real needs of the University and of students, and the direction of more specific and perhaps more obviously applicable studies cannot well be determined.

The entire questionnaire need not be filled out at one sitting, but each separate section should be, if possible. The total estimated time necessary to complete the questionnaire thoughtfully, is one hour. The whole should be looked through before you begin on any part; and each separate section should be read through carefully before any of that section is answered. Answer each question according to your own best judgment, whether or not that may agree with your friends'. You need have no fear of expressing yourself with entire frankness on any point.

A particularly important feature of the investigation is the Time Chart. This aims to show how students as a whole spend their time—how much for study, how much for recreation, how much for extra-curriculum activities, etc. This information will in no way be used against you or be considered with reference to you as an individual. Group information, however, is only as reliable as its individual components, and your particular care is besought in keeping an accurate and careful record of the distribution of your time during the coming week. Further suggestions as to the use of the Time Chart are printed thereon. Reliable information as to the distribution of time is of the greatest value to the University, to those interested in various student activities, and to each student, as a means of checking up on what he does with his day. To insure accuracy the Time Chart should be kept from day to day, as you will realize if you try now to think just what you did with your time on any day of last week.

Questionnaires will be distributed by mail and collected by the members of the Student Committee, which has been organized by dormitory entries. They should be returned in sealed envelopes to the entry representatives not later than April 20. Students not living in dormitories should return their questionnaires by mail.

Although no signature is required on these blanks, it is necessary to study statistically the relation of data so obtained, to information already available through other sources. To permit this combination and study of significant correlations, and at the same time avoid any reference to individual names, the following procedure has been developed as assurance against any misuse of personal data.

Every student will be assigned a number, and the desired information from other sources (school and entrance record ; transcript of college record, etc.) will be cataloged for the purposes of this study under the respective numbers, the names being eliminated from such record. Then the questionnaire data when received will also be filed by number, thus bringing all related data about each individual together, without necessitating the use of his name for identification. This method requires that every student fill out and return the *questionnaire sent him*. Roommates should be especially careful not to confuse the data by inadvertently filling out each other's blanks. As a check against possible errors of this nature, each dormitory representative will have a check list of the names and corresponding numbers of students in his entry. When he has collected the blanks of all men assigned him, and assured himself that no numbers have been accidentally interchanged, *his check list will be destroyed*, as its purpose is merely to enable the committee member to check up on the men in his entry.

The Committee believes that this survey means the beginning of a new era at Yale, and that the response of the student body to this opportunity of self-expression will effectively demonstrate the soundness and value to the University, of student opinion. Your cooperation is earnestly sought as a means of encouraging a greater measure of student participation in future matters of University policy.

The response of University authorities to present-day student demands for a greater measure of responsibility, more freedom from restrictions and a voice in the discussion of University affairs may largely be determined by the way in which students meet the challenge of this Personnel Investigation.

You are, of course, under no compulsion to cooperate in this inquiry; replies are only sought from those students sufficiently interested in the principles at stake to spend genuine thought and effort on the questions raised. But if you do favor those principles, you are asked to prove it by assuming your full share of the responsibility involved. *Don't pass the buck.* The questionnaire follows.

EDUCATIONAL BACKGROUND

At what age did you complete your high or preparatory school course?

Estimate number of books (not in connection with school requirements) read the year *before* you came to college.

How many books on an average, not in connection with preparation of courses do you *now* read in a year?

Did you have much opportunity for good reading in your home?

In what types of recreation or hobby did you have the special encouragement of your relatives?

In what, if any, did you meet discouragement?

What are the chief social or recreational interests at your home?

How have you been in the habit of spending your summer vacations? (*e.g.* working, studying, traveling, social activities, sports, reading, etc.) Indicate relatively.

1.....2.....3.....

State occupation of father (or guardian).....

Nationality of father..... of mother.....

College degree, if any, held by father..... Name of college.....

College degree, if any, held by mother..... Name of college.....

FACTORS INFLUENCING CHOICE OF COURSES

Indicate degree for which you are a candidate (or, in the case of Freshmen, expect to elect). B.A. Ph.B. B.S. B.S.
(Engineering)(Non-Eng.)

What group of courses have you elected as your major field?

What courses have you taken because required directly or indirectly, which you did not wish to take?
State impressions thereof.

On what course have you spent most time?

State reasons.

On what course have you spent least time?

State reasons.

On what course have you spent most intellectual effort?

State reasons.

On what course have you spent least intellectual effort?

State reasons.

In what course has work most satisfactory to yourself been done?

Why?

In what course has work least satisfactory to yourself been done?

Why?

Which course do you regard as the most valuable to you?

Why?

Which do you regard as the least valuable to you?

Why?

In which courses have you obtained your best grades?

In which have you obtained your worst grades?

Which of the following factors do you regard as the most potent in determining *choice of courses of Yale students in general*? Write in any others you may wish to add. Indicate what seems to you the relative order of importance (first, second, and third) in the spaces provided.

Cultural aims	Opinion of other students	Subject matter
Vocational training	Faculty advice	Quality of teaching
Personality of instructor	Family's advice	Technical course of study requirements
Relative ease	Friends' advice	Convenience of schedule

1 2 3

Which of these factors have been most important in determining the *choice of your own major field of study*?

1 2 3

Which factors have been most important in determining *your choice of individual courses elected*?

1 2 3

What do you consider from the undergraduate viewpoint, the most important factors in stimulating genuine undergraduate interest in curriculum work? Indicate relative importance in the numbered spaces provided. Add any others you feel are particularly significant.

Cultural value	Utilitarian or vocational value
Personality of instructor	Relation of subject to other courses or interests
Method of organization of course	Sectioning of classes according to ability
Subject matter	Special privileges for honor students
Method of presentation of material	A system analogous to "pass and honors" differentiation
Small class or seminar system	"Orientation Courses" for Freshmen (educational)
Instructor's knowledge of subject	Required or voluntary courses in "the choice of a career" (vocational)
His ability to teach	

1 2 3

What particular courses or group of courses, if any, either *positively* or *negatively*, have definitely affected your life purpose?

To which of the following (or other) factors do you attribute this influence? State their relative order of importance, in the spaces provided.

Previous interests	Intellectual stimulation	Personality of some individual teacher
Subject matter	Method of organization	Reactions of other students
Utilitarian or vocational value	Quality of teaching	Family comments

1 2 3

To which of these factors do you attribute any marked *positive* value to you of certain courses?

1 2 3

To which of these factors (or lack of them) do you attribute any marked *negative* value to you of certain other courses?

1 2 3

Judging from your courses at Yale, what do you consider the most important characteristics in a successful teacher?

Professional reputation	Scholarship and research	Method of presentation of material
Knowledge of subject matter	Enthusiasm	Teaching experience
Devotion to teaching for its own sake	Personality	Teaching technique

1 2 3

What suggestions as to the improvement of teaching, from the student viewpoint, have you to make?

Apart from any question of family influences, economic necessity, etc., what occupation do you think you would most like to follow if you had requisite means and complete freedom of choice?

What do you like to do as an avocation or hobby?

What extra-curriculum activities do you regard as most valuable to the development of an individual?

Which do you regard as most valuable to the life of the university community?

Why?

, ECONOMIC BACKGROUND

Approximate annual income of your family:

Less than \$3,000		\$10,000 to \$15,000	
\$3,000 to \$5,000		\$15,000 to \$25,000	
\$5,000 to \$7,000		\$25,000 to \$50,000	
\$7,000 to \$10,000		Over \$50,000	

Indicate by *checking* within which of the above groups you think your family income *probably* falls. If you do not know, guess.

Amount of personal income or allowance

Amount of expenditures

For College year

For vacation periods

Amount of personal earnings

During term-time

During vacations

Total income and earnings for entire year..... Total expenditures.....

Have you earned by term-time employment any substantial part of your expenses? If you have, indicate
approximate earned proportion of total college expenses. Was this from necessity or choice?

Have you had to work during summer vacations to earn part of your expenses? How many years?

If not, have you worked during summer vacations for experience? How many years?

If you have had to work your way, do you think the extra effort justified?

If not, would you have come even if self-support had been necessary?

MOTIVES FOR COMING TO COLLEGE AND FOR VOCATIONAL AND CURRICULUM CHOICES

While you were at high or preparatory school, what occupation did you think most seriously of entering after graduation from College?

When entering Yale did you have any definite vocational aim?.....If so, what?

What are your *present* vocational or professional purposes, if any, in relative order?

1..... 2..... 3.....

Reasons for change, if any, in vocational purpose

To what extent was this determined (positively or negatively) by family's business or professional connections?

To what extent by family tradition or other family influences (not vocational)?

In your opinion, what are the most essential qualifications and requirements for the career *first* named above?

What qualifications or characteristics of your own have influenced your present vocational or professional preference?

Are any positions known to you personally that will probably be available for you upon graduation? Yes () No ()
Describe briefly.

What were your chief reasons, first for wishing a university education, generally; and second for choosing Yale rather than some other college? Indicate by number below which of the following reasons seem to you the three of most importance in each case; write in any others you think should be included.

Because of intellectual curiosity

For general culture

For the prestige of having a Yale degree

For general social prestige

Because of parents' wishes

Because friends were coming

To make a good scholastic record

Because it seemed "the thing to do"

Because so urged by previous teachers

To prepare for some definite career

(a) Professional

(b) Business

Interest in some particular subject of study - (*state what*)

For development of college friendships and associations

Because of specific interest in some other non-athletic extra curriculum activity (*state what*)

To have a good time

Because of specific interest in athletics (*state what sports*)

To enable you to make more money

To develop your mind

To try and "make" some society

Because your home was in or near New Haven

Because of family tradition

.....
.....
Reasons for wishing a University education, in general.

1..... 2..... 3.....

Reasons for coming to Yale particularly.

1..... 2..... 3.....

Which of these factors do you think most interest Yale students in general?

1..... 2..... 3.....

Which of these seemed most important to the majority of boys at your school, or other associates of your own age, before you came to college?

1..... 2..... 3.....

Which seemed to be your parents' chief interest, with reference to your college career?

1..... 2..... 3.....

Which of these have been the most important in determining your actual activities and attitude during college?

1..... 2..... 3.....

Which, if any, of these ambitions do you feel you have realized to a reasonably satisfactory degree?

1..... 2..... 3.....

Which of the following factors (or such others as you may wish to write in) do you think are most important for achieving "success in college" according to typical undergraduate standards?

Excellence of scholastic achievement

Intellectual ability as related to studies

Intellectual ability not necessarily related to studies

Industry and application

Preparatory school friendships

Athletic prominence

Prominence in other extra-curriculum activities

Political ability

Social prominence

Wealth

Personality

High personal ideals

1..... 2..... 3.....

According to *your own personal standards* which of these factors do you think most important for *real* success in college?

1..... 2..... 3.....

What factors chiefly influenced (or are now influencing) your choice between Yale College and the Sheffield Scientific School?

Dormitory accommodations

Influence of the social system

Influence of locality of your room in Freshman year

Opinion as to relative ease of curriculum

Direct advice of instructors or counsellors

Desire for practical industrial training

Indirect influence of instructors or counsellors

Economic considerations

Preference for a particular degree

Interest in particular subjects of study

Influence of extra-curriculum interests, etc.

Personality of instructors (positively or negatively)

Vocational or professional aims

Discrimination between "Yale" and "Sheff"

1..... 2..... 3.....

Was your choice between Yale College and the Sheffield Scientific School in line with your original intentions, or changed during the Freshman year?

If the latter, which of these (or other) influences have changed your opinion?

1..... 2..... 3.....

Do you believe the Freshman Year serves considerably to help the Freshman become oriented?

Has it done so in your case?

What is your opinion of the value of The Freshman Year in general?

Do you believe a greater measure of student self-government at Yale is feasible?

Do you think that students would seriously accept more responsibility in self-government were the opportunity offered?

Do you think undergraduates are sufficiently mature and experienced to justify the University in seeking student opinion on administrative or disciplinary questions?

On educational questions?

What do you think would be the chief obstacle to a greater degree of student participation in the development of University policies?

Have the majority of the questions asked on this blank been of real interest to you and do you think an investigation of this type worth while?

If not, have you filled this out through a sense of duty rather than through genuine interest?

Would you be willing to cooperate in another inquiry covering somewhat different points sometime next year?

Do you think students as a whole would welcome and cooperate in some investigation along these general lines (but not so extensive in nature, or taking so long to complete) once each year?

Various "interest analysis" blanks have been prepared by vocational and educational experimentors in an attempt to develop some objective measure of the individual's aptitudes and inclinations. These are said to assist students in orienting themselves with reference to courses of study they may profitably pursue, the type of profession or vocation for which they are probably best fitted, etc. Would you be willing to spend fifteen or twenty minutes taking one of these "interest analysis" tests in order that we may determine the practical value of such tests by comparing your responses thereon with your otherwise expressed inclinations or demonstrated abilities?

Please estimate and enter here the total amount of time you spent in filling out this questionnaire (*not* including time spent on keeping your Time Chart record).

Add any general comments you may wish to make, about either the questionnaire or the problems raised therein.

SAMPLE STUDENT TIME CHART

STUDENT TIME CHART

Week of April 12-19, Beginning Monday morning, April 12.

See directions on reverse side

School (College, S.S.S., or Freshman Year) _____

(From the opening of college until the beginning of Xmas vacation)

(From end of Xmas vacation to beginning of Easter vacation)

	Mon	Tues	Wed	Thurs	Fri	Sat	Su	Week's Total		Total for Average Fall Week	Total for Average Winter Week
<i>Scholastic Work</i>											
Class and Laboratory Periods											
Preparation for Classes											
TOTAL FOR SCHOLASTIC WORK											
<i>Student Organizations</i>											
(Giving names, e.g., News, Playcraftsmen, etc.)											
Publications											
Dramatics											
Musical Clubs											
Debating											
Religious, Y.M.C.A., etc.											
Class Committee											
Student Council, etc.											
Fraternities and Societies											
TOTAL FOR NON-ATHLETIC ORGANIZATIONS											
<i>Organized Athletics</i>											
Major Sports (<i>state which</i>)											
Minor Sports (<i>state which</i>)											
Athletic Managership											
Competing for Athletic Managership											
TOTAL FOR ORGANIZED ATHLETICS											
<i>Unaided Exercise</i> (corrective gym., etc.)											
<i>Recreation</i>											
Exercise, sports, etc. (not for team competition or training)											
Reading (not in preparation of class room work)											
Lectures, concerts, etc., attended											
Theaters, movies, etc.											
Cards, "parties," etc.											
Dances and social activities											
Informal discussions, "dope sessions," etc.											
TOTAL FOR RECREATION AND LEISURE											
<i>Work-Support</i>											
All time spent earning college expenses											
<i>Travels</i>											
<i>Other Activities not included above</i>											
TOTAL											

BE SURE TIME RECORD FOR EACH DAY TOTALS 24 HOURS, AND FOR EACH WEEKLY TOTAL, 168 HOURS

DIRECTIONS

1. **KEEP THIS DAY BY DAY.** At the end of each day think back over what you have done from hour to hour, and make entries accordingly.
2. **DO NOT COUNT ANY ACTIVITY UNDER TWO HEADINGS.** If you cannot decide whether a certain amount of time should be classed as SOCIAL or LEISURE for example, put it arbitrarily under either one. Please be consistent in such classification.
3. **AT THE CONCLUSION OF THE WEEK,** when you have totaled all columns and know just how you spent your time during that period, fill in the estimates for distribution of time during an average week in the fall session (up to Christmas) and make a similar separate estimate for an average week in the winter session (Christmas to Easter). Do not try to make these estimates before completing your record of time actually spent during the coming week.

This time chart makes it possible for you to obtain an exact record of how you spend your time from April 12 to 19. This will give you a basis for estimating your fall and winter time-distributions much more accurately than would otherwise be possible. If, for instance, you are spending say 20 hours a week in preparation of courses now, and had a much harder schedule the first term, you probably spent 30 hours on the average up to Christmas and 25 between Christmas and Easter. When entering time-distribution for fall and winter weeks, do so by comparison with the time-distribution actually kept for the week of April 12 to 19. Take a typical or average week for such estimates—*i.e.*, not such a week as that of the Princeton game last fall or of mid-year examinations last winter. Show your time as it was actually spent—not as you think it should be. Don't be afraid that such information will in any sense reflect against you. Your name will not even be used in compiling the statistics. The Committee guarantees absolutely that your confidence will not be violated, and that the records will not be accessible to any other student, or University officer, for disciplinary, scholastic or other purposes than those contemplated in this investigation.

4. **INCLUDE TIME SPENT FOR LOCAL TRAVEL** under the appropriate activity. This is: time spent going from one class to another should be included under Class and Laboratory periods; time spent going out to the Bowl for a game of tennis, as exercise under recreation; time spent going down to the Harbor and back for regular crew work, should be included under Organized Athletics, etc.
5. **BE SURE THE AMOUNTS OF TIME SPENT ON ALL YOUR ACTIVITIES EACH DAY TOTAL 24 HOURS, AND FOR THE WEEK 168 HOURS.**

Keep this Time Chart for the period of one week beginning Monday morning, April 12, and ending the following Monday morning. During that week also fill out the Student Questionnaire, so that both the Questionnaire and the Time Chart can be sealed in the envelope enclosed and returned to your Entry Representative on the Student Committee, or mailed *not later than April 20*.

6. **PLEASE NOTE AND COMPUTE, ON A WEEKLY BASIS ONLY, THE SUB-TOTALS CALLED FOR** under "Scholastic Work," "Non-Athletic Organizations," "Organized Athletics" and "Recreation and Leisure," and enter these sub-totals in the respective spaces provided. This, as well as the estimated weekly totals, for the fall and winter sessions, already referred to, should of course be entered *after completion* of your detailed and accurate record for the week of April 12-19.

APPENDIX C

APPENDIX C

FURTHER DETAILS OF THE STUDENT SURVEY PROCEDURE

AS supplementary to the discussion in Chapter II, of the amount and degree of Survey coöperation obtained from students, the following description is given of the detailed procedure adopted.

The major part of the credit for the gratifying response of students to the Survey is due to the personal interest and efforts of the Chairman of the *Yale Daily News*, Mr. Russell Lee Post, 1927, and other prominent undergraduates initially favorable to such an undertaking. The project developed gradually as a result of discussion, among the members of the Student Advisory Committee of the University Bureau of Appointments, of the need for better methods of orientation, vocational guidance, placement, etc., and the belief that a Personnel Survey intended to throw light on existing situations would be a logical first step toward such needed development. To the original group of students interested, a few others were added later and entire details of the investigation, preparation of the blanks, etc., was carried out by that Student Committee, working with the writer over a period of about two months preceding the Easter vacation.

Announcement of the plan in the columns of the *News* and its enthusiastic editorial support by Mr. Post and other writers aroused a great deal of undergraduate opinion, some favorable and some unfavorable. The first reaction in some instances was based on misconception of the purpose of the investigation and the assumption that it would involve prying into students' personal habits and inclinations. There was also fear that information might possibly be used against students individually or collectively, which, besides, whether so used or not, was nobody else's business anyway. Consequently there appeared daily in the communication column of the *News* let-

ters violently attacking or strongly upholding the project, all of which served to focus attention upon it. Coincidentally, therewith, appeared a series of articles, mostly by the writer, explaining the real purpose of the investigation, outlining the nature of the questions to be asked, and giving instructions as to procedure. A series of statements secured from the President and other officers of the University, as well as from some members of the Faculty chosen particularly with respect to their influence upon student opinion, also appeared prominently in the *News* just before and during the week of the Survey.

Thus it will be seen that fortunate circumstances made possible the assistance of an elaborate publicity campaign chiefly conducted by students themselves in their own paper. Furthermore, the development of the plan was such that it could properly be presented to the student body as something spontaneously originated by undergraduates themselves, which was literally the case. In both the articles and the Questionnaire, emphasis was placed upon the opportunity which such a Survey offered students for expressing their opinions and for demonstrating that students were willing and ready to devote real time and effort to such questions if given a chance to do so. Thus coöperation with the investigation was asked by leading students as a demonstration that the student body was justified in demanding more opportunity for expression of its opinions and control of its own problems.

As a matter of interest and in illustration of the extent of publicity which such a project, properly presented, can secure from the student body in its own periodical, reproductions of a series of clippings from the *News* articles about the Survey are given in Chapter II.

*Importance of the Dormitory
Representatives*

AN important part of the whole Personnel Survey program was the group of student dormitory representatives, through whom the Survey was conducted. The original Student Committee previously referred to was formed into an Executive Committee which also selected the dormitory representatives, thus completing the entire Student Survey Committee. One member of the Executive Committee served from each class, as class representative, and selected other members of his own class as representatives, one for each entry, of the dormitories in which that class was housed. He explained the plan to the prospective dormitory representatives first and secured their coöperation before their appointment.

After each class group of dormitory representatives had been thus made up, an informal meeting of the group was arranged. The plans of the Survey, its purposes and possibilities were outlined to each class group and informal consideration and discussion of possible objections and misunderstandings followed. It was hoped that each entry representative would thus be informed as to the project in sufficient detail to be able to tell the men in his dormitory about it and to enlist their coöperation. During the course of the Survey these entry representatives were requested to keep in touch with the men in their entries, make necessary explanations about points which were not clear, and generally to see that the men in the entry were keeping their Time Chart records properly and completing the questionnaire.

The importance of the Student Committee and dormitory representative method was clearly indicated when the returns were due. In fact, despite the elaborate publicity campaign, the series of articles published in the *News*, and other means of propaganda favorable to the Survey, the most important factor in securing the coöperation of a large number of students appears

to have been the entry representatives. A number of these committeemen, without any coercion or undue effort on their part but with real interest in the possibilities of the undertaking, were able to secure replies from between 75 per cent and 90 per cent of the students in their territory; while every entry which, according to subsequent investigation, had been at all properly canvassed by the committee representatives, yielded at least a substantial majority of returns. On the other hand there were cases where men for one reason or another, although having agreed to serve on the student committee, actually contributed nothing to it or even evidenced indifference. In such cases they reduced the percentage of returns from their territories even below what they would probably have been had no representative been appointed there.

Some index as to the effect of the publicity campaign by itself and unaided by entry representatives, is offered in replies from a substantial group of students, 404, not living in University dormitories. In the case of men living in dormitories, the Questionnaires were collected by the dormitory representatives; while a stamped return envelope was enclosed for the convenience of men not housed in dormitories. The majority of the latter lived at home. These were not followed up by any personal solicitation as were those living in dormitories and only 139, or just one-third of this group, made returns while 58 per cent of replies came in from dormitory occupants. It is therefore evident that the entry representative system almost doubled the effectiveness of the Survey and that without genuine coöperation from a majority of the committeemen, the information obtained would have been far less significant and representative than it actually was.

Value of Subjective Opinions

So far as possible, of course, objective methods and criteria have been used in the investigation. Where dependence upon subjective estimates, as

for example, in order to differentiate groups of students on the basis of attitudes, etc., was unavoidable, it is recognized that sources of error difficult to control were thereby introduced. Where the actual subjective opinion of the individual may be regarded as a valid criterion of the attitudinal differentiation sought, its dependability is a function, chiefly, of the sincerity of replies. Evidence already cited and study of the questions analyzed in Appendix D warrant confidence on this important point. Where the major source of error lies in the individual's likelihood of arriving subjectively at an accurate estimate or decision. Thus of course the validity of the response is questionable, irrespective of its apparent sincerity or reliability and whether the latter be statistically or inferentially estimated. The nature of the investigation is obviously such that different degrees of credibility may be ascribed thereto by different individuals.

Long elaboration of statistical refinement cannot justifiably be called upon to demonstrate conclusively the scientific reliability of each step. The writer's personal conviction as to the seriousness with which the investigation was taken by the student body and the resulting dependability which can be placed, within the limits already discussed, upon the resulting data, rests in no small measure upon the cumulative effect of careful study of the blanks themselves. The mute testimony they offer cannot all be distilled and exhibited as evidence that this conviction is based upon something tangible and not merely attributable to prejudice or naïf credulity.

Sample Comments on Value of the Study

IN other words, only a similarly detailed investigation of the original blanks and a study, by another investigator, of how the questions were answered would prove a thoroughly scientific check upon the present writer's opinion. As this is a desideratum unlikely of attainment, brief evidence for our claim is here offered in the form of quotations from general comments on

the questionnaire, offered by students at its conclusion, in response to the following suggestion.

Request: "Add any general comments you may wish to make, about either the questionnaire or the problems raised therein."

Replies:

"WHY ask each man what he considers to be general undergraduate opinion, when you will find that out accurately from these questionnaires?"

"Concerning the part of the questionnaire on success at college, I wish to add that wealth is absolutely no aid to any real success."

"Would be worth while to have similar questionnaires filled out by prospective entrants to Yale each year. What Yale wants is character and personality more than mere book-work proficiency. The answers from prospective students would help in this way more than all the College Board exams put together."

"Concerning student self-government, although I am not strongly in favor of it, I believe that the University authorities should at least regard certain desires of the undergraduate body. It has been proven by unanimous vote that daily chapel is not desired, and since the students have such little part in University government, I believe that it is quite unfair for college authorities to refuse to the undergraduates this evident desire."

"Am very much interested to know results."

"Being a student here for only about seven months I cannot answer these questions as well as if I were an upperclassman. Therefore it would seem to me better to make future questionnaires fit the experience of the man to whom sent. On the whole I think very well of the idea of this questionnaire and the questions contained therein."

"Very hard to give more than one definite answer for question where three answers are required."

"In regard to courses, I think there should be fewer required courses and more electives. Also ——— has an inefficient set of professors and the course is made undesirable due to the excessive number of outside hours required. One of the professors in this course needs to take an English course. I believe that there should be more consideration paid to student opinion (Chapel situation) and that unlimited cuts should be given to quality credit students."

"The questionnaire seems to be of as great value to those who fill it out as to the inquirer. The time chart, especially, makes one think about how he is spending his time and discover whether he is using it to full advantage."

"I'm sure everyone would be interested in the results and personally would like to see them in as complete a form as possible."

"It is a matter of wonder to me that it is deemed necessary in a civilized community to ask if a boy has ever had an opportunity to read good books."

"In regard to courses here I think there are too many required courses and not enough courses that one with more freedom of choice could take, that would be of practical value in his vocation or profession."

"Not knowing what all this is to be used for I feel unqualified to comment on the seeming irrelevance of most of the questions. The connection between the statement on the first page and the questions themselves seems very vague."

"I am opposed to the questionnaire for the simple reason that many of the questions are *too personal*, and also because we, the students, do not know whether or not the remarks within this sheet will be held against us in any way.

"Many of the questions cannot be answered at all except by guessing; and if everyone guessed, what is to be gained by the statistics required? Many answers deserve more than *three* spaces."

"The questionnaire seems too long, and some of the questions too deep. If two pages a term were sent out to all the students to fill out, instead of seven pages all at once, I think the students would not be overwhelmed so much with the task of filling them out and be more willing to cooperate."

"Since the American educational system is such as it is, the college will become more and more like a preparatory school in that it will form the foundation of future study or general education. In order to attain this the college authorities, I think, will have to restrict the choice of studies to students, and require of them a broad general background. The plea of individualism belongs to graduate schools in their respective departments rather than in the college."

"In my humble opinion I do not think that there should be any greater participation by the students in University policies. Those things which today are almost unanimously desired or detested are brought before those in control through the *News* and personal conversation and receive due consideration. The average student has all he can do in determining and maintaining his own life's policy without adding the burden of a University."

"(a) The worth of an investigation of this sort depends first on the amount of time and thought put into it by the undergraduates—and second on the care and discounting of the investigators. Too many sociological generalizations are apt to miss the mark. Individual differences must be carefully accounted for, and the unwillingness, or laziness of the undergraduates in filling out this blank frankly, carefully, and thoughtfully must therefore be discounted from the general results.

"(b) Testimony in individual cases is liable to be about 50 per cent correct, through no fault of the testifier, but due to faulty memory processes."

"I would suggest if a group of 300 students were tested, that instead of having answers to simply check off, you allow the student to do his own original thinking. Assuredly the answers to questions in the present form can neither be of value nor can they be intrinsically representative."

"Questions are too much of the same character. Perhaps the great powers running this enterprise can with their omnipotent wisdom see the value of them but I, inferior and unintelligent, cannot. Nevertheless I may say that I expected questions far more foolish and insane."

"Greater freedom in choice of studies and fewer compulsory courses."

"My interests have changed since entering and consequently some of my answers may not be of value in statistical treatment."

"I have the following suggestions to make from my own experience: (a) that Freshmen be given more personal attention (by Personnel Bureau or faculty) in order to help them adjust to college life; (b) that upperclassmen be given more voice in the policy of the college, at least more coöperation between faculty and students."

"Questionnaire seems very interesting. Was glad to coöperate and would think the information could have a great intrinsic value."

"Too wide a variation of answers will be received."

"I think it is an individual problem which confronts each person to decide how to spend his time, choose his courses, and make his decisions. One of the chief advantages of a College Course, it seems to me, consists in this necessity of making one's own decisions and in profiting by one's own mistakes. Therefore any scheme for a cut and dried method of advising students seems poor to me."

"Many of the questions are difficult to answer upon only a few moments' reflection. Many of the factors run into each other and one cannot say that particular ones influence the individual to the total exclusion of the other factors. The questionnaire could be made more interesting."

"Concerning this questionnaire: Coöperation might more easily be won by definite statements as to what this questionnaire is expected to accomplish and by assigning the reason or reasons for each question. The columns of the *News* could be used for such a purpose.

"I think that it would have been much better if this questionnaire were divided into two parts and distributed half in the Fall and half in the Spring. The questions were too complicated and involved."

APPENDIX D

APPENDIX D

SUPPLEMENTARY STUDENT SURVEY DATA

THIS section of the Appendix contains certain additional Student Survey data not contributing directly to our main investigation. Together with preliminary reports on the questions since analyzed more fully in preparation for this book, the following articles originally appeared in *The Yale Daily News*. Below is given a complete list of these *News* articles, with dates of issue and reference to corresponding sections of the present volume.

<i>Number of Article</i>	<i>Date of Appearance in Yale News</i>	<i>Subject of Article</i>	<i>Corresponding Section of Present Report</i>
1	June 9, 1926	General preliminary report	II-III
2	Nov. 2, 1926	Amount of time spent in study—student expenses	III-V
3	Nov. 4, 1926	Factors determining choice of courses	Appendix D-1
4	Nov. 11, 1926	Causes given for choice between College and Sheffield Scientific School	Appendix D-2
5	Nov. 17, 1926	Characteristics of successful teachers—methods of improving curriculum	Appendix D-4
6	Nov. 18, 1926	Influence of courses on students' life purpose	Appendix D-3
7	Nov. 23, 1926	Reasons for coming to college	Appendix D-7
8	Nov. 24, 1926	Student estimates of extra-curriculum values	Appendix D-6
9	Dec. 2, 1926	Worth of the Freshman Year	Appendix D-5
10	Dec. 8, 1926	Own occupational purpose	VII
11	Jan. 6, 1927	Motivating effect of extra-curriculum activities	IX
12	Jan. 13, 1927	Influence of parents' education	VI
13	Feb. 2, 1927	Comparison of students in different extra-curriculum activities	IX
14	Feb. 10, 1927	Orientation of students	VII
15	Feb. 17, 1927	Influence of parents' occupation	VI

The following material not utilized in preceding pages is here included both because of its relation, however indirect, to what has gone before, and in order to complete the record of our Student Survey undertaking. The articles in this section appear practically unchanged from their original form.

I. FACTORS DETERMINING CHOICE OF COURSES

CERTAIN questions on the Personnel Survey concerning choice of courses were formulated so as to allow replies to be arranged in the order of importance, according to each student's opinion. The answers received to such questions have been analyzed both on the basis of giving weighted values to the first, second, and third choices in each case and also separately, on the basis of first choices only. There is uniform agreement between the results obtained by these two methods, but the analysis of first choices only gives somewhat more sharply marked and therefore more readily discernible differences than that which takes into account the weighted influences of second and third choices as well. The present series of articles will therefore give the results obtained by tabulation of first choices only.

Several succeeding articles in this series will deal with the answers to various questions which were thus considered. In most cases several of the alternate answers between which students were requested to choose were so related to each other as to make it advisable to consider the replies in groups. That is, replies to each of the several factors suggested were computed first and then such factors as seemed to express relatively similar viewpoints were combined into analogous groups. The results have in all cases been worked out on a percentage basis, as this affords the most convenient means of comparison.

The first of these questions considered is as follows:

Which of the following factors do you regard as the most potent in determining choice of courses of Yale students in general? Write in any others you may wish to add. Indicate what seems to you the relative order of importance:

Cultural Aims, Vocational Training, Personality of Instructor, Relative Ease,	Opinion of Other Students, Faculty Advice, Family's Advice, Friends' Advice,	Subject Matter, Quality of Teaching, Technical Course of Study Requirements, Convenience of Schedule.
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1	2	3
---	---	---

Which of these factors have been most important in determining the choice of your own major field of study?

1	2	3
---	---	---

Which factors have been most important in determining your choice of individual courses elected?

1	2	3
---	---	---

This question must be considered in three parts: first, what is considered by students to determine the choice of courses of other students in general; second, what factors actually have operated to determine such choices of a major field of study for the individuals replying; and third, what factors have actually operated to determine their choice of *particular* courses.

Analysis of the material shows that a major

field of study is determined by different factors than affect the choice of individual courses—*i.e.*, answers to the second part of this question differ materially from replies to the first and third parts.

The first part asks for opinions regarding what factors are supposed to influence students in general, the second and third parts, as to what factors actually have influenced the particular in-

dividuals replying. Comparison of the data in the table given below shows such close conformity as to indicate that student opinion on this question is on the whole well founded and reliable.

The single factor obtaining the largest number of votes in the first part of this question was, for the College, Personality of Instructor, for the Sheffield Scientific School, Vocational Training. Subject Matter stands second in both schools. The

natural interest of Sheffield Scientific School students in Vocational Training appears consistently throughout many other questions as well.

The specific replies to each part of the above question are distributed as follows, when the various individual factors have been arranged in related groups. Decimal fractions are given representing percentages of the total replies received for each group.

Student Opinion as to Factors Influencing Choice of Courses

	<i>Personality of Instructor and Quality of Teaching</i>	<i>Social and Family Influence</i>	<i>Technical Course of Study and Schedule Requirements</i>	<i>Vocational Training</i>	<i>Cultural Aims</i>	<i>Subject Matter</i>
I. Factors thought to influence choice of Yale students in general.						
All College	.30	.11	.09	.09	.19	.22
All S.S.S.	.14	.18	.15	.25	.12	.17
Freshmen (1929)	.11	.14	.06	.23	.26	.20
All Undergraduates	.21	.15	.10	.15	.19	.20
II. Factors which are reported by the students as having actually influenced their choice of a major field of study.						
All College	.13	.05	.05	.14	.32	.30
All S.S.S.	.06	.13	.12	.43	.05	.22
Freshmen (1929)	.06	.09	.02	.28	.29	.25
All Undergraduates	.10	.07	.06	.24	.25	.27
III. Factors reported by students as having actually influenced their choice of particular courses.						
All College	.25	.06	.05	.08	.20	.29
All S.S.S.	.16	.05	.23	.21	.08	.26
Freshmen (1929)	.10	.07	.09	.19	.24	.30
All Undergraduates	.21	.06	.12	.13	.19	.29

The conformity previously mentioned between answers to the first part and those to the third part of the question can be readily seen in this table. Choice of a major field of study is naturally determined by rather different factors than those governing the election of individual courses. Vocational Influences are by far the most important in determining the Sheffield students' choice of a major, with Subject Matter second (these two obtaining together nearly two-thirds of the votes). In the College, Cultural Aims and Subject Matter are the most important determinants of a major field of study and obtain between them over 60 per cent of the votes.

The choice of individual courses elected how-

ever is less dependent on these factors. Personality of the Instructor here strongly influences choice of the College student and Technical Course of Study Requirements evidently have a surprisingly important effect on Sheffield decisions, as to particular courses chosen.

The analysis of answers to this question may be summarized briefly as follows:

(1) Student opinion, as to the factors influencing the choice of courses of other students, conforms so closely to the influences actually operative upon the students reporting, as to indicate high validity and reliability of student opinion on this subject.

(2) Sheffield students are primarily influenced

in the choice of a major field of study by opportunities for Vocational Training, and College students by Cultural Aims.

(3) When it comes to selecting individual courses rather than a major field of study, Personality of the Instructor becomes an important factor for Yale College students and Technical Course of Study Requirements for Sheffield students.

(4) Social and Family influences are in all cases relatively unimportant; and Cultural Aims seem to play an insignificant part in the choices of the Sheffield students.

The data for all undergraduates as a whole, and for Freshmen alone, both reflect a combination of College and Sheffield influences and therefore are not of special significance so far as this particular question is concerned.

II. CAUSES GIVEN FOR CHOICE BETWEEN COLLEGE AND SHEFFIELD SCIENTIFIC SCHOOL

ONE of the most important Survey questions dealt with their reasons for preferring one or the other of the two upper undergraduate schools.

Present-day interest in this topic makes of particular significance the answers to this question, which was phrased as follows:

What factors chiefly influenced (or are now influencing) your choice between Yale College and the Sheffield Scientific School?

Dormitory Accommodations,
Influence of the Social System,
Influence of Locality of Your Room in Freshman Year,
Opinion as to Relative Ease of Curriculum,
Direct Advice of Instructors or Counselors,
Desire for Practical Industrial Training,
Indirect Influence of Instructors or Counselors,

Economic Considerations,
Preference for a Particular Degree,
Interest in Particular Subjects of Study,
Influence of Extra-Curriculum Interests, etc.,
Personality of Instructors (positively or negatively),
Vocational or Professional Aims, or
Discrimination between "Yale" and "Sheff."

Was your choice between Yale College and Sheffield Scientific School in line with your original intentions, or changed during the Freshman year? If the latter, which of these (or other) influences have changed your opinion?

The votes of Freshmen as well as of upper-classmen were analyzed separately on the basis of the degrees for which they expected to be candidates.

Interest in Particular Subjects of Study and Cultural Aims were the most important factors determining the preference for Yale College, polling nearly half of the votes from students already in the College or expecting to enter it. The next most weighty influences for this group were, Preference for a Particular Degree, 30 per cent; Vocational or Professional Aims, 19

per cent. No other single factor secured more than 3 per cent of all the votes, a negligible proportion. For Sheffield students, Desire for Practical Industrial Training came first with Vocational and Professional Aims second, these together receiving over two-thirds of all the B.S. candidates' votes. Interest in Particular Subjects came third with 21 per cent. Only 6 per cent of the Sheffield group indicated Preference for a Particular Degree as having determined their choice.

Answers to previous questions showed no par-

ticular differences in the point of view of Ph.B. and B.A. candidates in the College; but a considerable differentiation between these two groups appears in replies to the present question. It should be pointed out in this connection that the influence of certain factors involved may be much stronger than students consciously appreciate. For instance a student may sincerely feel that the dormitory question has not influenced his choice of an upper school, and yet this factor may have operated to a greater extent than he himself realizes. The reliability of replies to all these questions of course depends not only upon the student's sincerity and frankness but also upon his ability to analyze accurately his own motives. This is mentioned here because the present question is one for which such analysis is perhaps particularly difficult.

It is apparent that the chief reasons given by students as determining their preference for the College are cultural and curricular in nature; while those which most strongly influence other students to elect the Scientific School are primarily vocational or utilitarian. This fundamental difference in attitude between College and Sheffield men, toward a general education on the one hand and a specialized training on the other, is similarly evidenced with regard to many of the other questions asked in this Survey.

The findings in this respect appear conclusively to contradict many of the reasons suggested by graduates and others as to why more students enroll in the College than in Sheff. Such suggested reasons, for example, as the influence of dormitory accommodations, of the social system, and of other extra-curriculum factors, as well as the influence direct or indirect of instructors or counselors, all appear from the analysis of actual student opinions to be relatively insignificant in determining such choices. Students electing Sheff. do so chiefly for practical vocational reasons; but apparently the majority of undergraduates prefer the general educational subjects of study offered to a greater degree in the College.

The second part of this question dealt with the possible influence of the Freshman Year upon a student's choice of an upper school. Replies show that the Freshman Year has so operated in about 10 per cent of all the cases reported. In all classes a distinctly larger proportion of men now candidates for the Ph.B. degree stated that they had changed their original intention, than did candidates for either one of the other two undergraduate degrees. The Freshman figures conform in general to the data for the upperclass schools. The original analysis of these replies was made separately for each degree-group in each class, and the percentage of students who indicated a change in their original intention was, in each group, remarkably constant. Thus the proportion of Ph.B. candidates, who had altered their original choice, was for the four classes as follows: 1926, .26; 1927, .24; 1928, .27; 1929, .28. Similar consistency characterized the corresponding figures for B.A. and Ph.B. candidates.

A table (not here reproduced) shows that the same small percentage of men now enrolled as B.A. and B.S. candidates changed during Freshman Year from their original choice of an upper school. It was apparent from these replies that this was due, in the majority of B.A. cases, to preference for a particular degree or for a particular subject of study; and that change in favor of the B.S. degree was made chiefly for practical vocational reasons. The effect of advice or influence of instructors, in the case of the relatively few men who did so change, seems equally distributed as between the two schools and may probably be attributed to the apparent aptitude of individual students for one or another type of course offered.

A considerable proportion of men changed from their original intention of pursuing the B.S. degree, to election of the Ph.B., with consequent enrollment in the College rather than in Sheff. The reason given by such Ph.B. candidates for their change is chiefly that of interest, de-

veloped apparently during Freshman year, in certain courses of study. Vocational aims—possibly with this group leading toward economic studies—is the next most important factor. About 83 per cent of those who abandoned their original intention in favor of the Ph.B. degree state that they did so for one or other of these two reasons, which are probably, in this case, closely related.

The answers to the question as to choice between Yale College and Sheff. and reasons for change, if any, in this choice may be summarized as follows:

1. The greater College enrollment is due chiefly to the fact that many more students desire a general rather than a specialized education. The majority of students electing the College accordingly do so because of preference for particular studies, cultural aims, etc.; while most of those electing the Scientific School do so because they wish practical vocational training. Some Yale College students, espe-

Striking corroboration of the reliability of students' Questionnaire replies in general has lately been furnished by a subsequent and wholly objective investigation of this topic just discussed. A report to the Board of Admissions of Yale University by the Department of Personnel Study and based upon comparison of pre-matriculation and the Freshman year intentions re-

cially Ph.B. candidates, elect the College for vocational reasons, evidently to study so-called business courses.

2. About 10 per cent of all students during Freshman Year change their original choice of an upper school. A small proportion change from B.S. to B.A. and an equal proportion from B.A. to B.S. A considerably larger proportion change from B.S. to Ph.B.
3. Chief reasons for the change from B.S. to B.A. are cultural or curricular in nature; while the changes from the B.A. or Ph.B. to B.S. are chiefly for practical vocational reasons. The relative change in each group is remarkably constant for successive classes.
4. The more significant and important degree of change from B.S. to Ph.B. candidates may be ascribed in part to each of these two factors, probably in this case closely related to an interest in business studies.

garding the choice of an upper School, entirely confirmed the conclusions previously reached in the above article by analysis of subjective student opinion. The report in question (17) appeared in *The Yale Scientific Magazine* (Vol. II, No. 1, November, 1927, pp. 37-38) and in *The Yale Alumni Weekly* (Vol. XXXVII, No. 28, March 30, 1928, pp. 773-774).

III. INFLUENCE OF COURSES ON STUDENTS' LIFE PURPOSE

A QUESTION, closely related to those discussed in the last article, dealt with the influence of various courses on students' life purpose and factors to which influence could be attributed. Students were first asked what particular group of courses, if any, had so affected their purpose either positively or negatively. About one quarter of the replies indicated no such influence in either direction. About 64 per cent indicated that they had been positively influenced by one or some of their

courses and only 13 per cent that they had been negatively influenced. It thus appears that a substantial majority have been benefited positively with reference to their life purpose by their undergraduate courses and a small minority only have been detrimentally influenced in this respect.

The subjects most frequently credited with positive influence were English for College students (in 26 per cent of the cases) and Science

for Sheffield men (in 35 per cent of the cases). Science has also proved the largest negative influence for other Scientific students, comprising 10 per cent of the cases. Next to English in the College came History with 11 per cent; Languages (classical and modern), 9 per cent; Sci-

ence Group, 9 per cent; and Economics Group, 9 per cent. In this analysis Mathematics, which received only 1 per cent of votes, an insignificant proportion, has been classified with Science.

The second part of this topic is phrased as follows:

To which of these factors (or lack of them) do you attribute any marked negative value to you of certain other courses?

Previous Interests,	Intellectual Stimulation,	Personality of Some Individual Teacher,
Subject Matter,	Method of Organization,	Reactions of Other Students,
Utilitarian or Vocational Value,	Quality of Teaching,	Family Comments.

Answers to the first part of the question indicate that intellectual and cultural interests seem to be most influential in the case of College students and vocational values in the case of Sheffield students. The Freshman choices evidently reflect a combination of College and Sheffield points of view. The influence of effective teaching appears to be relatively unimportant in connection with the first part of this question.

When the specific positive value of certain courses and the negative value of others are considered, however, effect of the quality of teaching becomes more pronounced, and vocational influence less so. It may be inferred that utilitarian or vocational values are more related to a general point of view than to either the positive or negative value of special courses. It is also important to note that by far the largest *negative* influence

is that of bad teaching, which in all classes polls a substantial majority.

The replies were about evenly divided in this respect between quality of teaching and personality of some individual teacher. It is therefore evident that the negative side of both of these factors is considered more detrimental to the value of certain courses than the positive side is beneficial to others. In other words a course badly taught by a poor instructor is twice more apt to be condemned as worthless than a course well taught by a good instructor is apt to be praised for its positive value. This may perhaps evidence a typically critical attitude toward classroom instruction. On the other hand vocational values seem less important as a negative than as a positive factor.

IV. CHARACTERISTICS OF SUCCESSFUL TEACHERS. METHODS OF IMPROVING CURRICULUM

THE questions considered in this article deal with undergraduate interest in scholastic work, and the characteristics of a successful teacher. The

first of these questions was stated in the Personnel Survey as follows:

What do you consider, from the undergraduate viewpoint, the most important factors in stimulating genuine undergraduate interest in curriculum work?

Cultural Value,
Personality of Instructor,
Method of Organization of Course,
Subject Matter,
Method of Presentation of Material,
Small Class or Seminar System,
Instructor's Knowledge of Subject,
His Ability to Teach,
Utilitarian or Vocational Value,

Relation of Subject to Other Courses or Interests,
Sectioning of Classes According to Ability,
Special Privileges for Honor Students,
A System Analogous to "Pass and Honors" Differentiation,
"Orientation Courses" for Freshmen (educational), and Required or Voluntary Courses in "The choice of a career" (vocational).

The factor, among those given above, which obtained the largest number of votes from all classes is Personality of Instructor for which alone almost half of all the votes were cast. An unusually high degree of unanimity of opinion was evidenced in reply to this question. When this factor, Personality of Instructor, is grouped with others all making for teaching effective-

ness, it appears that, according to undergraduate opinion, improvement in teaching would do far more than everything else put together to stimulate interest in classroom work. The analysis of replies to this question after combining the returns for each of the above factors into related groups and expressing them in percentage terms, is as follows:

Factors Stimulating Undergraduate Interest in Curriculum

	<i>Cultural Values</i>	<i>Subject Matter</i>	<i>Utilitarian or Vocational Value</i>	<i>Emphasis on Honors Courses</i>	<i>Improvement in Teaching</i>
All College	.14	.13	.06	.05	.62
All S.S.S.	.09	.16	.12	.04	.59
Freshmen (1929)	.18	.14	.11	.03	.54
All Undergraduates	.13	.14	.08	.04	.61

Another question dealt with the characteristics, from the undergraduate viewpoint, of a successful teacher. The factor here held most important was Personality, with Knowledge of Subject

Matter second, and Method of Presentation of Material third. There was striking unanimity of opinion on the part of all classes, in replying to this question, which was phrased as follows:

Judging from your courses at Yale, what do you consider the most important characteristics in a successful teacher?

Professional Reputation,
Knowledge of Subject Matter,
Devotion to Teaching for Its Own Sake,
Scholarship and Research,
Enthusiasm,

Personality,
Method of Presentation of Material,
Teaching Experience,
Teaching Technique.

If the answers to the various topics are gathered into three related groups, the proportionate distribution in favor of each group is as follows,

again expressed in percentages of total first choices:

Characteristics of a Successful Teacher

	<i>Knowledge of Subject, Scholarship and Research, Professional Reputation</i>	<i>Devotion to Teaching, Enthusiasm, Personality</i>	<i>Method of Presentation, Teaching Technique, Teaching Experience</i>
All College	.22	.63	.14
All S.S.S.	.19	.57	.24
Freshmen (1929)	.23	.63	.14
All Undergraduates	.22	.62	.16

By far the lowest proportion of votes for any individual factor were those received by Professional Reputation, Scholarship and Research, and Teaching Experience, only 1 per cent of all the votes being cast for any one of these three factors singly. Personality alone secured as many votes as all the other factors put together. When this is combined with related factors the importance, from the undergraduate viewpoint, of personal qualities becomes even more strikingly preponderant.

In connection with the same topic students were asked for suggestions from their viewpoint as to the improvement of teaching. A number of interesting replies were made which have been classified into related groups. A little less than half of all of the suggestions were directed toward improvement of the teaching personnel and a little more than half toward changes in the organization of requirements and course of study. The most frequent suggestions expressed, in one form or another, demand for extension of the method of Honors Courses, which obtained one-third of all the votes from students in the

College and almost as many from Sheff. Closely related thereto was the appeal for greater opportunity of student self-expression in courses, which polled 9 per cent of all the votes. Better methods of orientation, with respect to the educational purpose and nature of different departments of study, was another suggestion, the new sophomore chemistry course in Yale College being cited as a welcome attempt in this direction.

Next to extension of Honors Courses, the largest number of requests were for instructors with more personality, which obtained 30 per cent of the votes. Combined with these in the table below were a few requests stressing demand for greater breadth of interest on the part of instructors. Other specific suggestions with reference to improvements in the teaching personnel were: less emphasis on published research, and more on teaching ability, as a criterion for promotion; higher salaries in order to attract better appointees; and less part-time instruction by graduate students. The statistical analysis of these various votes follows, expressed in percentages of all replies:

*Suggestions for Improvement in Teaching from the Viewpoint of Undergraduates**Suggested Improvements in Faculty Personnel*

	<i>All College</i>	<i>All S.S.S.</i>	<i>All Freshmen (1929)</i>	<i>All Undergraduates</i>
Instructors with more personality and breadth	.27	.37	.27	.30
Less emphasis with regard to promotion on basis of research publication	.08	.14	.09	.07
Less part-time instruction by graduate students	.04	.04	.02	.03
Higher teaching salaries in order to attract better men	.05	.03	.05	.05

Suggested Improvements in Organization of the Course of Study

	<i>All College</i>	<i>All S.S.S.</i>	<i>All Freshmen (1929)</i>	<i>All Undergraduates</i>
Extension of the system of Honors Courses	.34	.24	.27	.31
More opportunity for self-expression of students in classroom work	.09	.08	.09	.09
Better means of orientation	.07	.08	.13	.09
Fewer specific requirements	.03	.02	.09	.04
Discontinuance of the ten minute quiz system	.03	.01	.00	.02

V. WORTH OF THE FRESHMAN YEAR

AMONG the questions asked students was a series dealing with the value of the Freshman Year. A great majority of undergraduates voted strongly in favor of the common Freshman Year, as now organized. Seventy-eight per cent spoke in the highest terms of the value of the Freshman Year while 13 per cent praised it more moderately; only 9 per cent considering it of relatively small value. This is interesting when compared with the opposition expressed by many undergraduates at the time the common Freshman Year, as at present constituted, was first set up. That criticism, to be sure, was from students who had not operated under the present system of the Freshman Year common to both undergraduate schools; while the present favorable opinion is entirely from students who have experienced no other system than the present. As over 90 per cent of the undergraduates voting in the Personnel Survey favored the present system, and nearly 80 per cent of these did so very enthusiastically, there seems to be no doubt as to its present popularity.

Inquiries were made as to (1) whether the Freshman Year serves considerably to help the Freshman become oriented, and (2) whether it had so operated in the particular individual's case. While opinion was divided on the first question, only 52 per cent answering in the affirmative and 47 per cent in the negative, 76 per cent of the individuals claim actually to have been personally benefited and only 24 per cent state they were not so helped. This is another interesting example of the difference between student opinion as to factors influencing other students, and analysis of the actual influence of such factors, based upon what the students themselves have experienced.

Another set of questions dealt with students' interest and confidence in self-government. A small majority, 54 per cent, stated that they believed a greater measurement of self-government at Yale feasible, and a somewhat larger proportion, 62 per cent, also voted that students would seriously accept more responsibility in self-government were the opportunity offered. The next

question asked was "Do you think undergraduates are sufficiently mature and experienced to justify the University in seeking student opinion on administrative or disciplinary questions?" to which 85 per cent replied in the affirmative. The value of student opinion with reference to educational questions was upheld in 58 per cent of the replies. Students, therefore, feel that undergraduate opinion is worth seeking on administrative questions, and that students would accept more responsibility if afforded the opportunity; while the vote with reference to the value of student opinion on educational questions, and as to the feasibility of student government at Yale is much more evenly divided.

A number of interesting reasons are given to explain why so many less students consider self-government feasible, than apparently believe student opinion on administrative and disciplinary questions is of genuine value. The most frequently mentioned obstacles to a greater degree of student self-government are, lack of interest on the part of the students and a paternalistic attitude on the part of the University.

This criticism of undergraduates, on the grounds of apathy, by students themselves is rather contradicted by the replies to inquiries as to each individual's opinion regarding the value of the Personnel Survey and willingness to cooperate in similar other undertakings. Three-fourths of the students stated that the questions on the whole were of real interest to them and that they regarded an investigation of this type as worth while. Ninety-five per cent stated that

they would be willing to cooperate in another inquiry, covering somewhat different points, another year. This incidentally was the largest percentage of votes cast on any single topic in the entire investigation.

Another question asked whether students as a whole would probably welcome and cooperate in some investigation along these general lines once each year; 83 per cent replied in the affirmative. Ninety per cent stated that they would be willing to cooperate in an investigation as to the value of "interest analysis tests," designed to facilitate orientation, in order that the practical value of using such tests at Yale might be studied.

These various replies may be summarized briefly as follows:

1. Most students regard undergraduate opinion as worth seeking on administrative and disciplinary questions, and think students would accept more responsibility for self-government if the opportunity were offered.
2. A smaller majority believe a greater measure of student self-government practically feasible.
3. The difference in the proportion of affirmative answers on these two points is attributed, in the majority of replies, to student apathy; in the remainder, to lack of sympathy on the part of Faculty or Administration.
4. Students' actual replies to other questions indicate that they have themselves *underestimated* the degree of cooperation and interest which can be expected in this connection of undergraduates.

VI. STUDENT ESTIMATES OF EXTRA-CURRICULUM VALUES

Two somewhat related questions asked students in the Survey dealt with the relative value of different extra-curriculum activities and the factors thought to contribute most powerfully to "Success in College." The two following questions were asked concerning the first of these topics.

What extra-curriculum activities do you regard as most valuable to the development of an individual?

Which do you regard as most valuable to the University community? Why?

Students in general, as might be expected, showed particular interest in the topic of extra-

curriculum activities and many of the replies were sufficiently detailed and valuable to warrant a much more comprehensive discussion thereof than can be compressed into a brief summary of the present nature.

Although more votes were cast for sports than for any other activity, it was noticeable that among the students who filled out the questionnaire as a whole with the greatest care, and added the most interesting general comments at its conclusion, a considerable number favored either publications or some cultural activity, such as dramatics. While no definite quantitative analysis has been made of this tendency, for some reason the students who especially welcomed the opportunity of expressing their views through the Personnel Survey seemed to include a noticeably large proportion of men who held non-athletic activities to be of paramount value. The majority of students however name sports first in answer to both questions, the Sheffield vote being somewhat more favorable to athletics than that of the College.

Among the various sports, football was the particular branch most frequently mentioned, with crew second, though other forms of athletics were also specified as most valuable in a number of cases. Athletics received a somewhat higher percentage of votes for value to the community, than for value to the individual's development. The reason most frequently advanced in behalf of sports was their influence on the

spirit of the University and the resulting unification of feeling and community of interest which they produce among both players and spectators. Their next most important influence is held to be the physical and mental development they foster which, through benefit to the individual, betters the community as a whole. Another cause of many students' vote in behalf of athletics is their advertising value to the University and the resulting attraction here of the best type of men. Mention was made of the particular value of football not only for itself but because it makes possible the maintenance and provision of equipment for so many other sports as well.

Reasons given for valuing more highly certain non-athletic activities included first, in the case of the *News*, its power to unify student opinion by making it coherent and articulate; second, in the case of dramatics, the *Lit.*, etc., the great educational value to a University of having students, among their own extra-curriculum pursuits, recognize and appreciate voluntary cultural achievement. Such activities are also considered to favor self-expression and to check the tendency for students to become stereotyped. Fraternities, societies and clubs, as media for the exchange of opinions and for stimulating discussion, were also stressed in a number of cases.

The replies are classified in the following table, again expressed as percentages of the total vote.

Relative Value of Extra-Curriculum Activities to Development of the Individual

	<i>Athletics</i>	<i>Publications</i>	<i>Dramatics Debating</i>	<i>Other Cultural Pursuits</i>	<i>Social and Fraternity Interests</i>
All College	.56	.24	.06	.08	.06
All S.S.S.	.77	.09	.03	.04	.08
All Freshmen (1929)	.62	.13	.08	.08	.08
All Undergraduates	.62	.17	.06	.07	.07

Relative Value of Extra-Curriculum Activities to the University Community

	<i>Athletics</i>	<i>Publications</i>	<i>Dramatics Debating</i>	<i>Other Cultural Pursuits</i>	<i>Social and Fraternity Interests</i>
All College	.60	.24	.05	.03	.08
All S.S.S.	.69	.13	.00	.01	.16
All Freshmen (1929)	.68	.20	.00	.01	.10
All Undergraduates	.64	.22	.03	.02	.10

The other question discussed in this article was phrased as follows:

Which of the following factors (or such others as you may wish to write in) do you think are most important for achieving "success in college" according to typical undergraduate standards?

Excellence of Scholastic Achievement,
Intellectual Ability as Related to Studies,
Intellectual Ability not Necessarily Related to
Studies,
Industry and Application,
Preparatory School Friendships,

Prominence in Other Extra-Curriculum Ac-
tivities,
Political Ability,
Social Prominence,
Wealth,
Personality,
High Personal Ideals.

According to your own personal standards which of these factors do you think most important for real "success in college"?

The answers to these questions differed considerably although there was, in response to each considered alone, remarkable conformity of opinion throughout students from the different schools and classes.

Personality and Athletic Ability are considered most important for "success in college" according to "typical undergraduate standards," dividing between them almost 70 per cent of all the votes. Intellectual and Scholastic Ability stand next. The only significant difference between the College and Sheff. votes indicates that College

students vote Athletic Prominence as more important to success in college than Personality, while the reverse is true for Scientific School students. This appears to be in contrast with their respective views, analyzed above, regarding the relative value of extra-curriculum activities. It is interesting to note that Wealth is the only factor of influence receiving almost no votes in answer to either question. Scholastic excellence alone obtained only 4 per cent of the votes on the first question and 7 per cent on the second. The analysis of replies follows:

INCENTIVES TO STUDY

Factors Considered Most Important for "Success in College" According to Typical Undergraduate Standards

	<i>Social Factors</i>	<i>Prominence in Athletics</i>	<i>Prominence in Other Extra-Cur- riculum Activities</i>	<i>Intellectual Ability</i>	<i>Personality</i>
All College	.08	.38	.10	.12	.32
All S.S.S.	.08	.25	.08	.17	.43
All Freshmen (1929)	.06	.32	.06	.21	.35
All Undergraduates	.08	.34	.08	.16	.35

Factors Considered Most Important to Real "Success in College" According to Own Personal Standards

	<i>Social Factors</i>	<i>Prominence in Athletics</i>	<i>Prominence in Other Extra-Cur- riculum Activities</i>	<i>Intellectual Ability</i>	<i>Personality</i>
All College	.02	.02	.02	.45	.49
All S.S.S.	.01	.02	.03	.36	.58
All Freshmen (1929)	.02	.02	.02	.46	.48
All Undergraduates	.02	.02	.02	.42	.51

The most striking contrast between students' personal standards and their opinion of the typical standards of others is found with respect to Athletic Prominence. Ranking as high as Personality in what is thought to be the typical undergraduate's viewpoint, Athletic Prominence is insignificant as measured by students' *own* personal standards of real success. The effect of High Personal Ideals rises from only 1 per cent of votes on the first question to 10 per cent on the second. Next to Personality, Intellectual Abil-

ity is considered, according to students' personal standards, most important, the emphasis being evenly divided between such ability as related to studies, and intellectual ability not so related. The predominance of Extra-Curriculum Prominence according to assumed typical standards gives way almost entirely to Intellectual and Scholastic Ability, in the scale of students' personal criteria. Personality, however, is regarded even more highly in the latter case than in the former.

VII. REASONS FOR COMING TO COLLEGE

ONE of the set of questions already analyzed in part (Chapter VII) dealt with students' reasons for coming to college. This topic was divided into several parts, involving the desirability of any University education, and of coming to Yale particularly, from the various points of view of students in general, of their parents, of preparatory school associates, etc.

The first two parts of this comprehensive question were: What were your chief reasons, first for wishing a University education, generally; and second for choosing Yale rather than some other college? Indicate by number below which of the following reasons seem to you the three of most importance in each case; write in any others you think should be included.

Because of Intellectual Curiosity, For General Culture, For the Prestige of Having a Yale Degree, For General Social Prestige, Because of Parents' Wishes, Because Friends Were Coming, To Make a Good Scholastic Record, Because It Seemed "the Thing To Do," Because So Urged by Previous Teachers, To Prepare for Some Definite Career, (a) Professional, (b) Business, Interest in Some Particular Subject of Study (State What),	For Development of College Friendships and Associations, Because of Specific Interest in Some Other Non- Athletic Extra-Curriculum Activity (State What), To Have a Good Time, Because of Specific Interest in Athletics (State What Sport), To Enable You To Make More Money, To Develop Your Mind, To Try and "Make" Some Society, Because Your Home Was in or near New Haven, Because of Family Tradition.
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Reasons for wishing a University education, in general,

1	2	3
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Reasons for coming to Yale particularly,

1	2	3
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Two-thirds of the College students gave one or another of the various cultural reasons for wishing a University education, while almost as large a proportion of the Sheffield students gave vocational reasons. Social, Extra-Curriculum, and Family Influences all appear relatively insignificant in this connection. Replies to the second part of the question, however, show that Family Influences are as important as any other in determining the choice of Yale particularly. Another important consideration in this respect is Prestige of the Yale Degree. Cultural Influ-

ences are also significant and, in this case, equally so for Sheffield as for College students. Influence of Friends and Interest in Extra-Curriculum Activities attracts students toward Yale particularly, more than toward a University education in general, while the reverse is true of vocational motives. The analysis of replies, combined into related groups and expressed in percentages of all first choices, follows. As the answers of B.A. and Ph.B. candidates in the College revealed no significant differences, these are not separately reported.

INCENTIVES TO STUDY

Reasons for Wishing a University Education, in General

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.16	.68	.07	.00	.08
All S.S.S.	.56	.34	.06	.00	.03
All Freshmen (1929)	.33	.58	.06	.01	.03
All Undergraduates	.30	.57	.06	.00	.06

Reasons for Coming to Yale Particularly

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.04	.36	.17	.00	.42
All S.S.S.	.14	.38	.14	.00	.35
All Freshmen (1929)	.07	.40	.16	.00	.36
All Undergraduates	.06	.39	.16	.00	.39

Students were also asked to answer the following related questions: Which of these factors do you think most interest Yale students in general? Which seemed most important to the majority of boys at your school, or other associates of your own age, before you came to college? What seemed to be your parents' chief interest, with reference to your college career?

The replies show considerable variation from those analyzed above. For instance, although the students replying to the question indicated, in answers to the first two parts, that they *themselves* had been influenced to a small degree only by extra-curriculum and social reasons, they believe these same influences to have been almost as important as the cultural ones, for *Yale students in general*. In other words students think that *other* students are more attracted toward Yale by social and extra-curriculum influences than they feel that they themselves have been. The supposed point of view of preparatory school associates agrees closely with that attributed to Yale students in general. Here again the choice of

others is apparently thought to have been considerably influenced by social and extra-curriculum factors. Among the influences grouped under the general heading, Cultural Interests, is Prestige of a Yale Degree, which may have a social as well as a cultural significance, and which was considered to be the most influential *single* determinant for both school and college associates.

The views attributed to parents are still different, and predominantly favor cultural and educational factors. Interest in scholastic excellence here makes its first appearance. Family influence toward vocational training seems to be greater in the case of Sheffield men. Possibly the vocational preference consistently expressed, in replying to this and other questions, by members of the Scientific School may be attributed in part to this family interest in utilitarian training. The following set of answers, similarly presented, shows these various points of view and their divergence from those tabulated above, in which students expressed the relative importance of the factors influencing themselves most strongly.

*Comparative Analyses of Reasons for Coming to College**Which of These Factors Do You Think Most Interest Yale Students in General?*

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.05	.45	.29	.04	.16
All S.S.S.	.10	.43	.30	.03	.13
All Freshmen (1929)	.07	.44	.28	.06	.15
All Undergraduates	.07	.45	.28	.05	.15

Which of These Seemed Most Important to the Majority of Boys at Your School, or Other Associates of Your Own Age, before You Came to College?

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.08	.32	.37	.10	.14
All S.S.S.	.15	.33	.32	.08	.11
All Freshmen (1929)	.14	.32	.35	.10	.10
All Undergraduates	.12	.32	.36	.09	.12

Which Seemed To Be Your Parents' Chief Interest, with Reference to Your College Career?

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.16	.73	.08	.01	.03
All S.S.S.	.38	.54	.06	.00	.02
All Freshmen (1929)	.25	.63	.06	.02	.04
All Undergraduates	.23	.66	.08	.01	.03

It should be pointed out in this connection that the influence of certain factors involved may be much stronger than students consciously appreciate. Even allowing, however, in these answers for the effect of such subjective errors, the different points of view expressed probably characterize the respective student groups with reasonable reliability.

The two concluding parts of this particular series of questions were as follows: Which of

these factors have been the most important in determining your actual activities and attitude during college? Which, if any, of these ambitions do you feel you have realized to a reasonably satisfactory degree?

The replies are tabulated on the following page. As these may be significantly compared with those to the first question, the analysis of the latter is, for convenience, repeated here.

*Comparison of Expected and Actual Influences**Reasons for Wishing a University Education in General*

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.16	.68	.07	.00	.08
All S.S.S.	.56	.34	.06	.00	.03
All Freshmen (1929)	.33	.58	.06	.01	.03
All Undergraduates	.30	.57	.06	.00	.06

Which of These Factors Have Been Most Important in Determining Your Actual Activities and Attitude during College?

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.16	.59	.18	.05	.02
All S.S.S.	.40	.41	.15	.03	.02
All Freshmen (1929)	.23	.55	.12	.06	.03
All Undergraduates	.24	.54	.16	.05	.02

Which, if Any, of These Ambitions Do You Feel You Have Realized to a Reasonably Satisfactory Degree?

	<i>Vocational Training</i>	<i>Cultural Interests</i>	<i>Social Interests</i>	<i>Extra-Cur- riculum Interests</i>	<i>Family Influences</i>
All College	.08	.63	.20	.08	.00
All S.S.S.	.28	.41	.21	.07	.04
All Freshmen (1929)	.13	.54	.19	.15	.00
All Undergraduates	.15	.56	.20	.09	.00

It will be noted that Social and Extra-Curriculum Influences have played a greater part in determining students' actual attitudes during college than they did in stimulating their original interest in a University education. They also have given a relatively large measure of satisfaction. Cultural Aims, however, hold first place for both questions and seem to have been realized to a high degree. Sheffield students feel that they have been more influenced by cultural factors, and to have obtained more satisfaction from them, than from the vocational incentives which for them were originally preponderant. Apparently only half of those who went to Sheff. for utilitarian training feel that their aims were

as satisfactorily realized in this as in other respects.

While Cultural Aims in general seem to predominate throughout answers to the majority of all these questions, it is interesting to note that almost no students indicated Desire for a Good Scholastic Record as having been of primary interest either to themselves, or to their associates. This single factor received less than 1 per cent of all the votes in answer to the first four questions in this series. However, family desire for students' scholastic excellence seems to be much greater, and was voted for, as their parents' chief interest, by 10 per cent of the students replying. A like proportion voted for the same influence

in answer to the last two questions. It thus appears that while most Yale students believe themselves attracted toward college for "cultural reasons," very few come here with the admitted ambition for a particularly good scholastic record. Nevertheless satisfaction is later primarily realized through scholastic excellence in at least a substantial number of cases.

A third of all those in each class who answered

the first of this series of questions answered the last only negatively, indicating that they had failed to realize satisfactorily *any* of their original ambitions with respect to their undergraduate course. This in itself seems significant in connection with the arguments previously advanced, regarding inadequate purposive motivation for the undergraduate body as a whole.

APPENDIX E

APPENDIX E

A REPORT ON COURSE OF STUDY SUBMITTED BY COMMITTEE OF YALE COLLEGE STUDENT COUNCIL

THE following report has no direct connection with the Student Survey described in this volume and was prepared quite independently thereof. As in a sense, however, it represents the crystallization, two years later, of the same type of student criticism and interest in curricular problems as produced the Student Survey, the report is here appended.

The Student Council recommendations with regard to distribution requirements may seem at first sight to be somewhat at variance with the student comments analyzed in the concluding chapters of this book. It will be noted, however, that the student plan of distribution calls for a *purposeful* relation among the distribution requirements, interpreted for the student in terms of his real interests with greater opportunity than now exists for finding those interests. Distribution in the Freshman Year, according to the student plan, would serve what seems to be its proper purpose of facilitating orientation and developing a purpose which would lead to a greater measure of concentration in the latter part of the course.

In other words the very principles of *orientation, purpose, and later concentration around that purpose* which we have advocated, are also independently reached, through subjective analysis, by the Student Council Committee. The Student Council report is moreover so ably executed as to warrant its inclusion here if only as further evidence of the capacity and intellectual power of the undergraduate, and of the potential value to an educational institution of such data and criticism as students, when properly approached, will furnish.

STUDENT COUNCIL REPORT

(Reprinted from the *Yale Daily News*,
June 6, 1928)

UNDER the auspices of the Student Council of Yale College, a committee of Seniors consisting of Wilder Hobson, S. F. Kennedy, and A. C. Robertson has devoted the past two months to the study of the educational system of the University, and has drawn up the following report, suggesting a program in the administration of teaching that differs from the present one in certain points that are deemed desirable. The statement has been placed in the hands of the officers of the University and the heads of departments. Certain weaknesses in the existing educational system and general lines of procedure by which they may be strengthened are pointed out. It is hoped that the program will meet with sufficient approval to warrant further investigation and more detailed suggestion on the part of the committee.

Even the general principles outlined in this report are comparatively well known. The justification for their presentation lies only in the fact that they represent the independent judgment of the committee by which they were revised and approved. The chief sources of the report have been found in the personal experience of the members of the subcommittee and of the Council. Opinions of faculty members and systems of other colleges have been judged entirely in the light of that personal experience.

Suggestions for change in the educational system of Yale College are in no sense indicative of a disrespect for tradition on the part of their authors. Nor do they arise from an inability to

appreciate the importance of past experience as a guide to present policy. This report, on the contrary, finds its origin in the desire to draw from the past experience of Yale education its most significant disclosures and by the interpretation of this experience, to make increasingly operative that most compelling of Yale traditions, the preparation of men for the most effective and enjoyable service and leadership in the life of their times.

That the present curriculum requirements were designed to attain that end, no one can doubt. But since the formation of the existing machinery, deep-seated modifications have taken place in those very factors from which education derives justification for its existence. These changing factors may be defined as follows:

I. The demands made by contemporary life on the college graduate. II. The subject matter of education from which preparation for this life is drawn. III. The attitude of the student toward his educational environment.

It is not necessary to argue that modern life, for which education prepares, has reached a bewildering degree of complexity. The increase in the content of knowledge from which education is drawn is also a matter of wide recognition. James Harvey Robinson has accurately described both conditions in saying that the modern age is possessed of "an unprecedented body of knowledge, bearing with it unprecedented problems which in turn demand unprecedented solutions." It is the change in the third element, the psychology of the modern undergraduate, which is, as yet, little understood and often unjustly condemned.

A scrutiny of the motives which direct a student to enter college conclusively proves that comparatively few are moved by a desire to attain the rewards of scholarship. The majority are inspired by a wish to gain or maintain social recognition or to enjoy athletics and friendship. Yet in this they are not as a whole unlike the undergraduate of a decade ago. The divergence lies in

the increased difficulty which the faculty finds in compelling the undergraduate to make the most of his educational opportunities. And the source of this divergence may be described as follows: that, whereas the student of ten years ago fumed at and criticized the limitations set upon his curriculum pursuits, he did so with his tongue in his cheek, condemning himself the while for differing with those authorities, who, he thought, must, by very virtue of their position, be capable of describing to him wherein lay his own true pleasure and profit. *The modern undergraduate on the other hand, in addition to his fretful criticism, sincerely denies that age and positions of prominence are, in themselves, criteria of his educator's ability to direct him toward his own enjoyment and progress.*

This proposition is drawn from an analysis of the undergraduate's reaction to his scholastic requirements and an observation of the manner in which this reaction subsequently influences his intellectual acquisitions. On entering Yale the Freshman is told that for the attainment of an A.B. degree he must begin with a natural science, English, History, and a modern and classic language. The college faculty has so ruled and there's an end on it. These limitations are, moreover, imposed alike without variation, on that small number which is already possessed of a distinct intellectual interest as well as on that larger group which sees no connection between the subject of textbook or lecture and the realm of their own personal thoughts.

Those who are described as already stimulated are not allowed to pursue their study from the standpoint of that subject in which they are absorbed but are forced to treat a number of other fields as though they were laying the foundation for specialization in each. They sincerely resent the necessity of dispersing their effort and as a consequence show a tendency toward failure to grasp the significance of the content of other fields. In other words, they are prone to become narrow.

Those who are intellectually uninspired find neither the interrelation of the five courses on their schedule nor the contact of the whole with their own intimate mental processes. Having decided, therefore, that his courses neither concern each other nor the world of his own personal thoughts and ambitions, the average Freshman confidently resolves to make only that minimum expenditure of effort in the classroom which the award of an A.B. degree requires. Being, moreover, attracted by the goal of prominence through success in outside activities, he proceeds to expend an amount of mental energy in these pursuits which would, if applied to books, result in fruitful intellectual attainment.

It is quite obvious that the student having a personal intellectual interest realizes after the completion of his "group requirements," "progressives," and "majors" that he has missed a world of information in many fields which is necessary to the comprehension of his own subject. And it is also true that at the end of four years the exponent of extra-curriculum recognizes the vital meaning of his course of study. *Yet this is only to say that Yale's greatest contribution to her students consists in teaching them: I. What the term education means, and II. That they are not possessed of such a thing.*

It may be argued that the student's course of action and its unfortunate consequence arise from immature intellectual laziness. Yet it is interesting to note that the sentiment of intellectual distrust of authority increases as the Freshman approaches seniority. Even more significant is the conviction expressed by many sane and successful graduates that their extra-curricular and social activities have proved the most truly educational features of their College life.

Yet, whether or not this jealousy of independence arises from immaturity is both incapable of proof and irrelevant, if proved. *Its greatest significance lies in the fact that the modern undergraduate is making a sincere effort to think for himself. And if, as Mr. Robinson points out, our*

age is faced with "unprecedented problems requiring unprecedented solutions," Yale's compelling duty both to her students and to education is the developing of this very tendency toward original thinking.

Such a contention obviously implies the desirability of allowing the student a greater degree of freedom in his choice of courses. It would, however, be extremely unwise to permit the Freshman to concentrate in the subject which caught his fancy as he enters college. His interest in the chosen field would not be sufficiently strong to sustain the tediousness of productive specialization and even if such were the case, the student's background of general knowledge would be too limited to admit the development of breadth. *He must, first, therefore, be forced to scrutinize the major fields of knowledge with the dual purpose of discovering the subject which to him seems most vitally interesting and of pursuing that subject from the standpoint of its proper place in general knowledge rather than as an isolated intellectual compartment.*

If the Freshman is informed that the compulsion thereby made necessary is a conscious effort to aid him in arriving with maximum speed at the point where he can be granted a maximum of liberation, he will be less prone to resistance. His initiative will, as a consequence, be more forcefully operative and increased intellectual effort will result. His interest will be further augmented if the subject matter of his course is made truly introductory and interpretative rather than narrow and specific.

The contrast between the present Freshman requirements and those proposed in the report may be characterized as follows: The present courses in Biology, English, Latin, French, and History present themselves to the student as intellectual lines which never touch each other. Many Freshman minds pass between these parallel lines without crossing them at any point. We propose that these lines be made to converge at a given point and from thence extend in diverging directions.

As he proceeds through Freshman year the student will cross all of these lines of thought. If he is possessed of even an embryonic intellectual interest it will be aroused by contact with some one of the fields of knowledge to which he is introduced.

Having forced the student to look intelligently into the major fields of knowledge it would then be possible to give greater scope to initiative. If the undergraduate has given evidence of a sincere interest in a given field, he should be allowed to satisfy that interest by a reasonable degree of specialization.

The suggestions contained in this report have therefore a twofold purpose:

I. To present to the student in the first two years of college life an introduction to as many fields of knowledge as is possible without the sacrifice of penetration, calling attention to the interrelationship of all and pointing out the intimate human significance in each.

II. To permit the student who gives evidence of having developed a sincere intellectual interest to choose at the end of Sophomore year a field around which his work will be focused. He should not be required to gain in the last two years a technical knowledge of other fields but to maintain a conception of the points of contact of his own field with others and to increase his appreciation of other fields as a background for his own.

The courses of the A.B. degree should be more definitely related to a classical education. The lines of intellectual endeavor should progress from the Classics as a center. Yet the only difference between the present B.A. and the Ph.B. degrees is the substitution of Classical civilization for Latin. This is a trivial differentiation between two Yale degrees which should stand for two attitudes toward education. The classical standpoint should, therefore, find a more definite expression in the A.B. degree and the second attitude toward the fields of knowledge should

be more clearly defined and gain more complete voice in the Ph.B. degree.

There is certainly a demand for an education which teaches man's economic, physical, sociological, and artistic place in nature. Such an educational purpose would lend itself to the proposed method of introductory courses followed by concentration. It is, therefore, with the Ph.B. degree that this report is concerned. We propose that the Ph.B. degree be awarded to those students who have pursued their education from the standpoint of man's environment and his development therein.

Under this condition the student should be required to take the following six courses before the end of Sophomore year: I. A natural science, covering Chemistry, Astronomy, Physics, and Geology. II. A natural science, covering Biology, Botany, Zoölogy, and evolutionary Geology. III. A social science, including Anthropology, Economics, Government, Philosophy, and Psychology. IV. A survey of recorded history as now given in the Freshman Year. V. A history of the development of English literature from Chaucer to Hardy. VI. A history of the development of the Fine Arts embracing sculpture, painting, architecture, and music.

By taking these courses in the first two years the College man would obtain some comprehensive conception of mankind's development. This would be the center from which the lines of scholastic investigation would diverge. These lines as represented by the six courses may be described as follows: Courses I and II. The evolution of the earth and the development of life on it. III. The story of man's physical, mental, and social growth. IV. The record of man's actions since written history. V. The story of the literary expressions of our own language. VI. The evolution of man's artistic expression.

This course of study would give to the student an intelligent linking of education with contemporary life. It would hold for the student far more intimate personal significance than does his

present course of study. As a consequence the incentive to curriculum effort would be greatly increased. It would inspire many students whom the present system does not touch. It would fit the student to make at the end of Sophomore year a sane choice of a field in which to concentrate.

After his wide acquaintance with the various fields which the survey includes, the candidate for the Ph.B. degree would be prepared at the end of Sophomore year to select a major with some degree of confidence. Under the present system he has not encountered, at the time of choosing a major, many subjects which are essential to a discriminating selection of a main field of study. English is taken so extensively as a major because it is pleasant and because the average student has not had the significance and vitality of the sciences, fine arts, and social sciences impressed upon him. After the survey courses he will perceive the importance of these fields, and their bearing on his own status as a human product of a natural environment. The undue emphasis of English literature would disappear; it would cease to be the major of 75 per cent of the undergraduates, and their interests would be disseminated into various fields, and more evenly distributed. At present the student relapses into English naturally, for his first two years have been spent in taking courses which do not touch his actual life at all. He has viewed some seven or eight subjects without ever grasping their relation to contemporary civilization or to himself, many invaluable subjects have been withheld and he turns to English as the one field which interests him. Yale should not allow her students to throng one field when they display no sincere regard for a comprehensive knowledge of it, but she should provide them with the opportunity of grasping the whole import of the province of knowledge, so that they may then intelligently choose the particular branch which signifies most to them.

A man may now graduate from Yale without being held for a comprehensive understanding

of his major. He may take in his last two years as many as eight English courses, and if he passes them the University assumes that he has close knowledge of the history of English literature. These courses cover various periods which remain utterly unrelated in the mind of the average Senior. He has a fair knowledge of specific authors and ages, but he has not a clear view of the development of English literature from Anglo-Saxon to the present.

At the end of two years' study of such a major, a man should be held for a detailed knowledge of the whole course of English literature. To insure this, he should be given in May of the Senior year a comprehensive examination covering the entire field. The present requirements for completion of a major are far too simple, and allow men to graduate who have never been tested in that field to which they have devoted the most time and in which they are supposedly the ablest. *We recommend, consequently, that a comprehensive examination be given during Senior year in every field, and that the men majoring in that field be required to pass it for their degree.* Yale College should provide some means of satisfying itself that the students who are spending the greater part of their four years in one specific field have mastered that field.

The survey courses would afford the men who elect to take Honors a broader field to choose from than they have at present. This system would distribute them throughout the various fields instead of promoting concentration on English, which is now overtaxed while some departments have no Honors students. The Honors man at present is not granted sufficient time or prestige for his work. He is excused from four hours of classes or six, at the most, with the result that his Honors work is a side line subordinated to his regular class work. He is prevented from doing serious intensive work in his chosen field by the necessity of attending a number of courses, preparing against ten-minute papers and term examinations. He is penalized for his intelligence

and ambition rather than rewarded. *It is our belief that for Honors men the final two years should be almost wholly tutorial; from nine to twelve hours' credit should be given for their seminar work; they should be allowed to sit in on regular courses without enrollment and without examinations, and that they should be set an Honors examination at the end of their Senior year, covering their entire field.* In this way they would gain the benefit of the popular lectures without being hampered by the petty requirements which circumscribe such courses and they would pursue their main interest under the guidance of tutors.

At the end of the first two years, then, there should be a differentiation by the College between

the men who elect honors and those who prefer to complete their 120 hours in the usual manner. The Honors men should be given the greatest teachers for tutors instead of reserving such men exclusively for the large lecture courses. They should also be granted by the University a distinctive degree, for the recognition accorded them at present is slight, when it is considered that they are the few who make the chief end of College the attainment of an education. The democratic ideal of education can in this way be combined with the aristocratic; the ordinary man and the serious student are both handled according to their respective capacity, and neither is hampered by the other.

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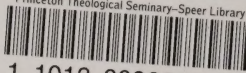
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